

**AREA MANAGEMENT REPORT FOR THE SPORT  
FISHERIES OF SOUTHEAST ALASKA, 2002**

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August 2003

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Alaska Department of Fish and Game

Division of Sport Fish



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Weights and measures (metric)		General		Mathematics, statistics, fisheries	
centimeter	cm	all commonly accepted abbreviations.	e.g., Mr., Mrs., a.m., p.m., etc.	alternate hypothesis	$H_A$
deciliter	dL	all commonly accepted professional titles.	e.g., Dr., Ph.D., R.N., etc.	base of natural logarithm	e
gram	g	and	&	catch per unit effort	CPUE
hectare	ha	at	@	coefficient of variation	CV
kilogram	kg	compass directions:		common test statistics	F, t, $\chi^2$ , etc.
kilometer	km			confidence interval	C.I.
liter	L			correlation coefficient	R (multiple)
meter	m	east	E	correlation coefficient	r (simple)
metric ton	mt	north	N	covariance	cov
milliliter	ml	south	S	degree (angular or temperature)	°
millimeter	mm	west	W	degrees of freedom	df
		copyright	©	divided by	÷ or / (in equations)
		corporate suffixes:		equals	=
		Company	Co.	expected value	E
		Corporation	Corp.	fork length	FL
		Incorporated	Inc.	greater than	>
		Limited	Ltd.	greater than or equal to	≥
		et alii (and other people)	et al.	harvest per unit effort	HPUE
		et cetera (and so forth)	etc.	less than	<
		exempli gratia (for example)	e.g.,	less than or equal to	≤
		id est (that is)	i.e.,	logarithm (natural)	ln
		latitude or longitude	lat. or long.	logarithm (base 10)	log
		monetary symbols (U.S.)	\$, ¢	logarithm (specify base)	log <sub>2</sub> , etc.
		months (tables and figures): first three letters	Jan,...,Dec	mid-eye-to-fork	MEF
		number (before a number)	# (e.g., #10)	minute (angular)	'
		pounds (after a number)	# (e.g., 10#)	multiplied by	x
		registered trademark	®	not significant	NS
		trademark	™	null hypothesis	$H_0$
		United States (adjective)	U.S.	percent	%
		United States of America (noun)	USA	probability	P
		U.S. state and District of Columbia abbreviations	use two-letter abbreviations (e.g., AK, DC)	probability of a type I error (rejection of the null hypothesis when true)	$\alpha$
				probability of a type II error (acceptance of the null hypothesis when false)	$\beta$
				second (angular)	"
				standard deviation	SD
				standard error	SE
				standard length	SL
				total length	TL
				variance	var
Weights and measures (English)					
cubic feet per second	ft <sup>3</sup> /s				
foot	ft				
gallon	gal				
inch	in				
mile	mi				
ounce	oz				
pound	lb				
quart	qt				
yard	yd				
Time and temperature					
day	d				
degrees Celsius	°C				
degrees Fahrenheit	°F				
hour (spell out for 24-hour clock)	h				
minute	min				
second	s				
Physics and chemistry					
all atomic symbols					
alternating current	AC				
ampere	A				
calorie	cal				
direct current	DC				
hertz	Hz				
horsepower	hp				
hydrogen ion activity	pH				
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

***FISHERY MANAGEMENT REPORT NO. 03-11***

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August 2003

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## ABSTRACT

Sport fishery management actions taken in Southeast Alaska during 2002 are summarized along with a description of the region and its sport fisheries. The region is divided into seven areas for management purposes and management and research activities along with issues in each area are described.

Key words: Southeast Alaska, sport fishery, fisheries management, Ketchikan, Prince of Wales, Petersburg, Wrangell, Sitka, Juneau, Haines, Skagway, Glacier Bay, Yakutat, surveys, access project, emergency order, management action

## INTRODUCTION

The Southeast Region of the Division of Sport Fish, Alaska Department of Fish and Game (ADF&G), encompasses all waters of Alaska from Dixon Entrance on the south to Cape Suckling on the north (Figure 1). Southeast Alaska provides a large variety of freshwater and saltwater sport fishing opportunities for anglers. Effort and harvest for the fisheries of Southeast Alaska are estimated through mail surveys which have been conducted annually since 1977 (Mills 1979–1994, Howe et al. 1995, 1996, 2001a, 2001b, 2001c, 2001d, Walker et al. 2002, and Jennings et al. *In prep.*). About 22% of all angler days of sport fishing effort in Alaska are expended in Southeast Alaska.

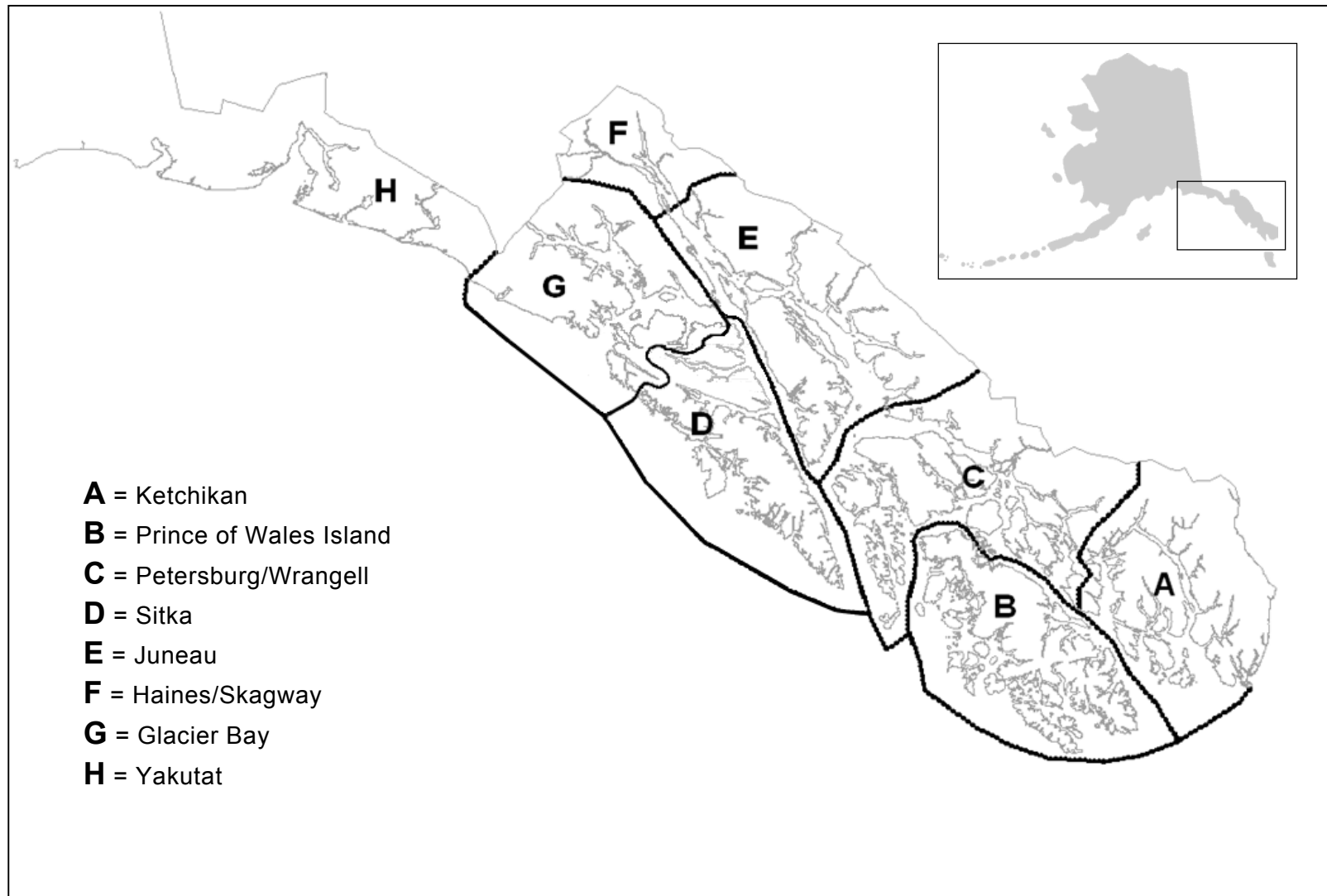
This report summarizes sport fishery management actions, issues, and activities in Southeast Alaska during 2002. Similar reports were previously published for 1994 and 1998–2001 (Bentz et al. 1996, Suchanek et al. 2001a, 2001b 2002, and Holmes et al. 2002).

Sport anglers provide the majority of the funding for Southeast Alaska sport fish management and research programs. The Federal Aid in Sport Fish Restoration Act (Wallop-Breaux), whose funds are received via federal excise taxes on sport fishing equipment and fuels, provides about 47% of the total budget. Sales of Alaska sport fishing licenses and tags (Fish and Game Fund) provide 36% of the budget. Small contracts, federal subsistence funds, U.S./Canada Letter of Agreement funds, and the Southeast Alaska Sustainable Salmon Fund provide the remaining 17% of the region's funding.

The Wallop-Breaux Amendment mandated that at least 15% of annual federal aid funding go toward

access projects that benefit recreational power boaters. The Sport Fish Division Access Program is a statewide effort designed to improve angler access to the state's sport fishing resources. Access projects are categorized into either large "CIP" projects for developing or improving major facilities or "Small Access Site Maintenance" projects for small repairs or improvements at existing sites. Projects are also classified as either "motorized boating" projects or "non-boating" projects. Funds spent on "non-boating" projects do not count toward the 15% mandatory spending.

The primary mission of ADF&G is to manage, protect, maintain, and improve the fish, game, and aquatic plant resources of the state, and manage their use and development in the best interest of the economy and well-being of the people of the state, consistent with the sustained yield principle. In 2002, the Division completed a strategic planning process to more clearly define the future of Alaska's sport fisheries and the Division of Sport Fish. The impetus for the plan was a desire to have a more coordinated approach to budgeting and planning of the division's management, research, and hatchery efforts. Through this process four goals were identified: 1) sustain recreational fishing opportunities while optimizing social and economic benefits from these opportunities; 2) conserve manage, and improve Alaska's aquatic, riparian, and upland habitats to ensure sustainability of Alaska's fishery resources; 3) foster a public that is consistently informed and involved in recreational fisheries; and 4) recruit, develop, empower, and retain a diverse, dedicated, motivated, and effective workforce. Within each goal is a list of desired outcomes, objectives, and key strategies to achieve the objectives. The strategic plan will provide direction for the division and its programs for the next five years (through 2007).



**Figure 1.—Boundaries of the eight harvest survey reporting areas (A–H) in Southeast Alaska.**

## MANAGEMENT AREAS

Sport fish management and research programs for Southeast Alaska are conducted from ADF&G offices located in Ketchikan, Craig, Petersburg, Sitka, Juneau, Haines, and Yakutat. For administrative purposes, these offices each correspond to surrounding management areas (Figure 1). These management areas also closely correspond to the eight survey areas for which harvests are estimated through the statewide mail survey (Walker et al. 2002). The areas listed in the mail survey include: Ketchikan (A); Prince of Wales Island (B); Kake, Petersburg, Wrangell, and Stikine (C); Sitka (D); Juneau (E); Haines-Skagway (F); Glacier Bay (G); and Yakutat (H).

## SPORT FISHERIES

Estimates of sport fishing effort and harvest are obtained from two primary sources: the Statewide Harvest Survey and the Southeast Marine Creel Survey. The Statewide Harvest Survey is a postal survey conducted by the Division of Sport Fish to estimate effort and harvest of all species on a statewide basis. Estimates from the Statewide Harvest Survey for 2002 will not be available until approximately October 2003. Therefore, estimates from the statewide harvest survey reported herein are for 2001.

The regional marine creel survey program has been in place since 1992. At that time the existing creel survey program was expanded to a comprehensive regional program to monitor sport harvests of chinook salmon as mandated by the King Salmon Management Plan. The primary goals of the program are to estimate inseason regionwide harvest of chinook salmon, chinook salmon of Alaska hatchery origin, and coho salmon of Alaska hatchery origin in the Ketchikan, Juneau, and Sitka fisheries. Additional tasks include estimating angler effort, harvest, and catch of all Pacific salmon species, Pacific halibut, lingcod, rockfish, and Dolly Varden; harvest per unit effort (HPUE) for chinook and coho salmon and Pacific halibut; and average weights of Pacific halibut and lingcod harvested in the above fisheries.

Southeast Alaska provides major sport fishing opportunities for several fish species that are limited in distribution in Alaska. In 2001, for

example, Southeast Alaska provided 97% of the cutthroat trout *Oncorhynchus clarki* and 71% of the steelhead *O. mykiss* sport catches in Alaska (Walker et al. 2002). Major opportunities for salmon and bottomfish also abound with the region producing the following percentages of total Alaska sport harvests in 2001: 39% of chinook salmon *O. tshawytscha*, 40% of coho salmon *O. kisutch*, 31% of Pacific halibut *Hippoglossus stenolepis*, 49% of rockfish *Sebastes*, and 61% of lingcod *Ophiodon elongatus*.

## EFFORT

Most sport fishing effort in Southeast Alaska (81%) occurs in salt water; the remaining 19% occurs in fresh water (Figure 2). Marine angling effort increased from about 200,000 angler-days in 1980 to about 409,000 in 2001. Similarly, freshwater effort increased from about 50,000 angler-days in 1980 to about 98,000 angler-days in 2001. Most of the recent increases in fishing effort are attributable to increased numbers of nonresident anglers fishing in Southeast (Figure 3). Since 1985, when numbers of resident and nonresident were about equal, the number of nonresident anglers has grown to over 80,000 while the number of residents participating in Southeast Alaska has declined to fewer than 30,000.

Creel survey information and local knowledge by area management biologists were used to estimate effort for each major species of sport fish in Southeast Alaska during 1998 (Suchanek et al. 2001a). Target species vary substantially, depending on whether anglers are fishing from a boat or shore in marine waters or in fresh water. Over 75% of the regionwide fishing effort was targeted on chinook salmon, coho salmon, or bottomfish (primarily Pacific halibut). About 44% of freshwater fishing effort was for trout or char (primarily Dolly Varden *Salvelinus malma*), while only about 4% of marine fishing effort was for these species. About two-thirds of all fishing effort was for anadromous salmon species.

## HARVEST OR TOTAL CATCH OF IMPORTANT SPECIES

The most important fisheries in the region, in terms of angler participation and economic value, are those for anadromous salmon. Sport harvests of coho and chinook salmon in Southeast Alaska

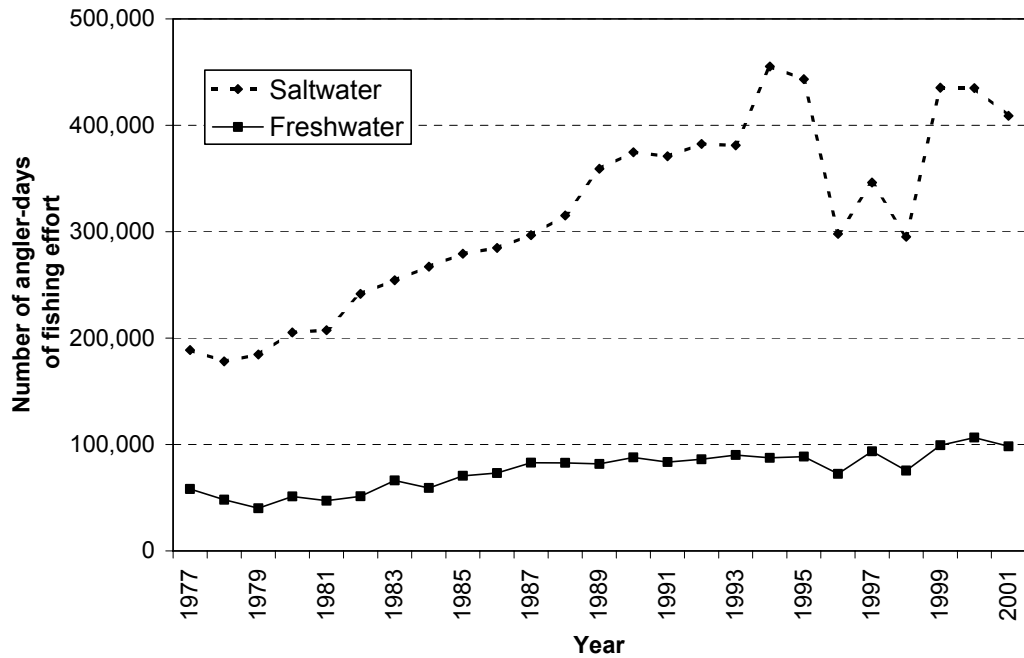


Figure 2.—Estimated angler-days of fishing effort in salt water and fresh water in Southeast Alaska, 1977–2001.

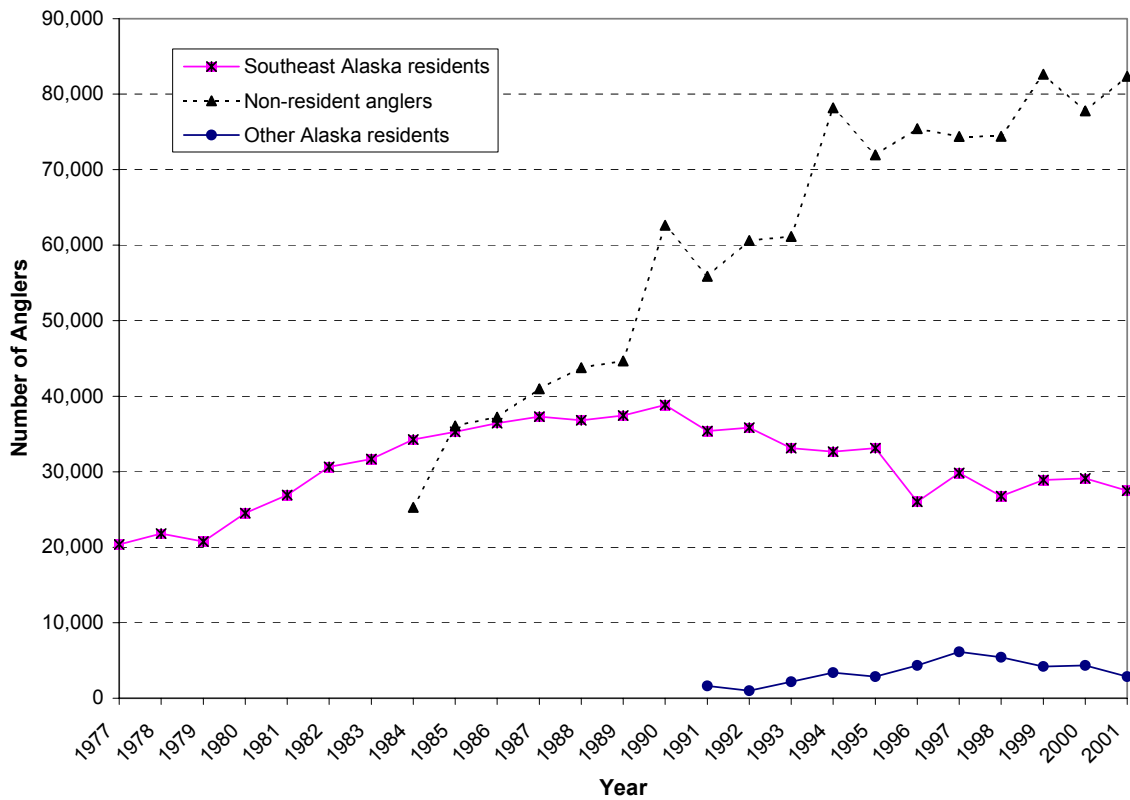
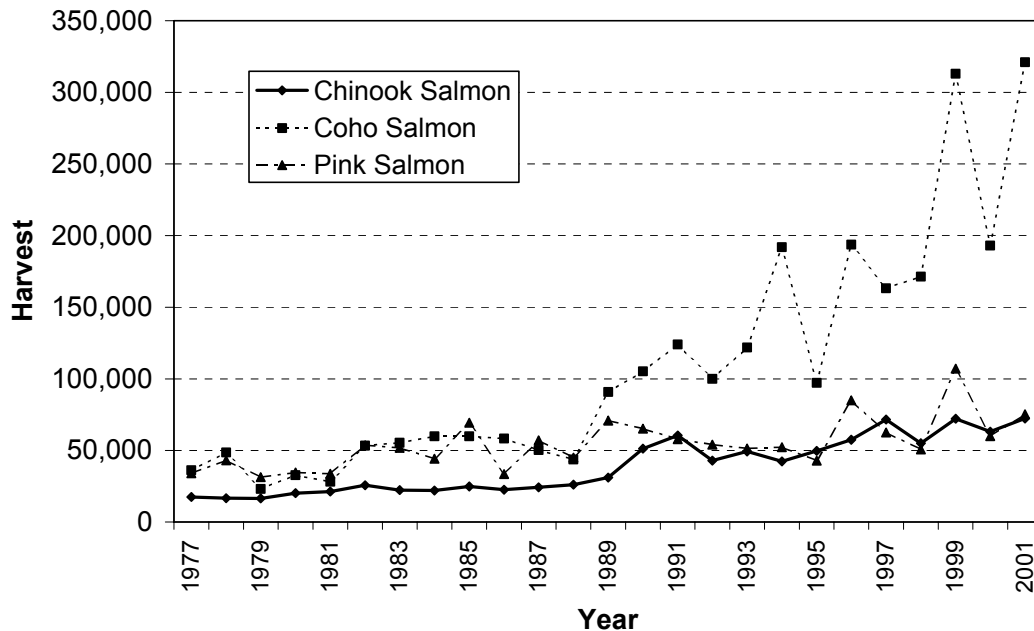


Figure 3.—Number of Southeast Alaska resident, nonresident, and other Alaska resident anglers fishing within Southeast Alaska, 1977–2001.



**Figure 4.—Estimated sport harvests of chinook, coho, and pink salmon in Southeast Alaska, 1977–2001.**

have increased significantly in recent years (Figure 4). In 1980, about 20,000 chinook salmon were harvested by the sport fishery. From 1998 to 2001 the chinook harvest more than tripled, to an average of about 63,000 per year. The chinook salmon harvest would have been even greater in recent years, except that the sport fishery has been allocated a fixed percentage of the quota set under the U.S./Canada Pacific Salmon Treaty since 1992. During the same time period, coho salmon harvests increased sevenfold, from about 33,000 in 1980 to an average of nearly 232,000 from 1997 to 2001. Pink salmon, *O. gorbuscha* harvests increased from about 35,000 in 1980 to an average of 71,000 during 1997–2001.

The next most important fisheries in Southeast Alaska are those for bottomfish; primarily Pacific halibut, rockfish, and lingcod (Figure 5). Pacific halibut harvest increased from about 6,000 fish in 1978 to an average of 108,000 during 1997–2001. Rockfish harvest increased steadily up until 1988 when it peaked at 57,000. Harvest then declined for several years to a low of 26,000 in 1990, and then increased again to a peak of 71,000 in 1999. The average rockfish harvest in the last five years

has been 56,500. Since lingcod distribution is limited primarily to the outer coast, harvest primarily occurs in the Sitka and Prince of Wales areas. Lingcod harvest has averaged about 19,500 annually for the last five years.

The most important freshwater fisheries are those for Dolly Varden, cutthroat trout, and steelhead. Dolly Varden harvest peaked in the mid 1980s at about 60,000 and has since declined to average about 20,400 during 1997–2001 (Figure 6). Only about one out of every five Dolly Varden caught are harvested. Cutthroat trout harvest declined from about 23,000 in the late 1970s to about 15,000 in 1993. In 1994, more restrictive regulations (minimum size limits, reduced bag limits, and gear restrictions) were placed on all cutthroat trout fisheries. Since then the harvest has averaged about 5,000 cutthroat trout per year and only about one of every nine cutthroat caught has been harvested. A minimum size limit, reduced bag limit, and annual limit for steelhead were also enacted in 1994. Steelhead harvest in the last five years has averaged about 225, but the annual catch averaged almost 19,000. Prior to 1994, steelhead harvest averaged 3,200, with a peak of 5,400 in 1989.

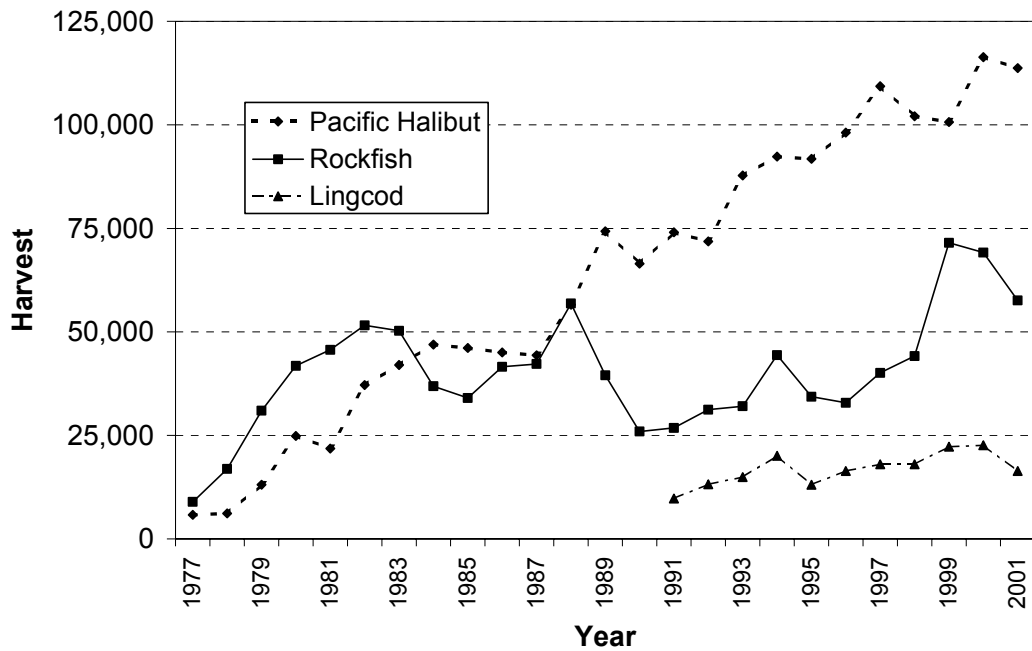


Figure 5.—Estimated sport harvests of Pacific halibut, rockfish, and lingcod in Southeast Alaska, 1977–2001.

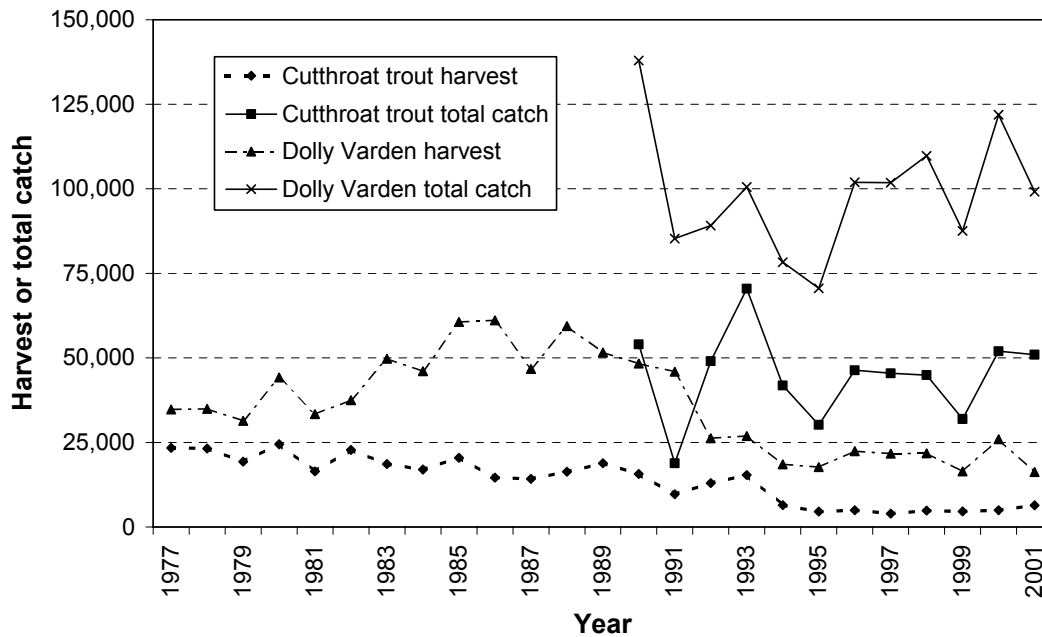


Figure 6.—Estimated sport harvest of cutthroat trout and Dolly Varden in Southeast Alaska, 1977–2001, and total catches of these species, 1990–2001.

## **REGIONWIDE ACTIONS AND ISSUES**

### **CHINOOK SALMON MANAGEMENT**

Chinook salmon are fully allocated in Southeast Alaska among user groups. A quota, established under the Pacific Salmon Treaty, limits the harvest of chinook salmon by all commercial and sport fisheries in Southeast Alaska. The Alaska Board of Fisheries (Board) has allocated a share of this quota to the sport fishery and the rest to various commercial gear groups. In 2000, management of the sport fishery for chinook salmon changed substantially under the revised management plan passed by the Board. The objectives of this plan were: (1) to manage the sport fishery to attain a harvest of 20 percent of the annual harvest ceiling specified by the Pacific Salmon Commission, after subtracting commercial net harvest; (2) to allow uninterrupted sport fishing in salt waters for king salmon, while not exceeding the sport fishery harvest ceiling; (3) to minimize regulatory restrictions on resident anglers not fishing from a charter vessel; and (4) to provide stability to the sport fishery by eliminating inseason regulatory changes, except those needed for conservation.

The primary changes to the plan to achieve these objectives were: establish sport fishery regulations prior to May 1 and have the regulations remain in effect for the entire season—except as needed for conservation; provide more specific regulatory action at various levels of chinook salmon abundance; and implement more restrictive regulations on nonresidents and anglers fishing from charter vessels. Under this plan, the commercial troll fishery continues to be managed to harvest the remainder of the all-gear quota after subtracting the net allocation and projected sport harvest. Cumulative sport harvests above the sport fishery allocation come out of the troll quota and are to be paid back in future years by not implementing more liberal regulations in the sport fishery, and the cumulative number of unharvested fish (underage) is applied as an offset against excess harvests in prior or future years.

#### **Preseason Management**

Management of chinook salmon fisheries in Southeast Alaska is based on abundance. A coast

wide model projects the abundance of chinook salmon and calculates a preseason abundance index, which correlates to a preliminary chinook salmon quota for Southeast Alaska. Since the preseason abundance index is usually not received until April, the bag and possession limits and other measures for the coming year are based on the prior year's abundance index until the new preseason abundance index is obtained. The 2001 abundance index was 1.14, so the appropriate regulations (1 king salmon bag and possession limit and 3 king salmon annual limit) were implemented by emergency order on January 1, 2002 (1-01-02EO). On April 25, 2002, the chinook salmon preseason abundance index of 1.74 was announced. This abundance index was significantly higher than the previous two years. The resulting all-gear quota was 356,464 fish and the sport fishery allocation was 66,507 king salmon (excluding most Alaska hatchery fish and fish harvested in the Situk River).

According to the plan, when the preseason abundance index is greater than 1.5, the bag limit for resident anglers is 2 fish. However, because the sport fishery had a cumulative overage from prior years, nonresidents were limited to a 1 fish bag limit and a 3 fish annual limit. These revised regulations were implemented via Emergency Order (1-04-02EO) on April 26, 2002. Given the high allocation and relatively restrictive regulations, it was projected that the sport fishery would harvest less than its allocation by approximately 8,000 to 15,000 fish.

Creel survey data were used to track harvest trends and project total harvest and treaty harvest for 2002. Final estimates will not be available until the statewide harvest survey is completed for 2002. The preliminary harvest estimate is 85,183 king salmon, of which approximately 26,800 were Alaska Hatchery fish. The estimated harvest of treaty fish was 58,403 king salmon. Based on the preseason abundance index (1.74) the sport fishery harvested less than its quota by about 8,100 fish.

#### **Cumulative Harvest Tracking: 2000–2002**

The Southeast King Salmon Management Plan does not specify whether cumulative harvest tracking is based on the pre- or the post-season abundance index. Based on the post-season



index, sport harvests estimated for 2000 and 2001 equate to 26% and 19% of the combined sport/troll allocation, and the combined sport overage is 7,540 fish. However, assuming that the 2002 post-season abundance index and sport harvest estimate don't change significantly from the preseason index and preliminary harvest estimate, the sport fishery will have a cumulative underage of 565 fish for the three years that the current King Salmon Management Plan has been in effect (Table 1).

### **Terminal Harvest Area Management**

Regulations provide the opportunity to increase bag limits by emergency order in terminal areas to increase the harvest of Alaska hatchery chinook salmon. In 2002, bag limits were increased in a number of freshwater and marine areas to harvest excess hatchery chinook salmon, including jacks less than 28 inches in length. These areas are described in each management area later in the report. Most of these Alaska hatchery chinook salmon do not count toward the allocation. In addition, chinook salmon caught in many of these areas (where limits were three or more chinook salmon  $\geq 28$  inches in length) did not count toward nonresident annual limits.

### **LINGCOD MANAGEMENT**

In February 2000, the Alaska Board of Fisheries substantially changed management of lingcod fisheries in Southeast Alaska in response to an apparent widespread decline in lingcod abundance. The Board established a guideline harvest level (GHL) management approach for sport and commercial fisheries in Southeast Alaska, allocated the GHL among sport and commercial fisheries in each of seven management areas, and reduced allowable harvests by setting the GHL lower than recent harvest levels.

Under the new approach, the sport fishery was to be managed to maintain lingcod harvest at or below harvest guidelines (in pounds) in each of seven management areas. In addition to its normal authority to restrict time and area in the sport fishery, the department requested additional authority from the Board to impose size limits and annual limits to reduce lingcod harvest in the sport fishery. Given limitations of the Department's

harvest assessment program, staff told the Board that the sport fishery would be managed on a year-to-year basis, and two of the areas (CSEO and NSEO) would be managed for a combined allocation. After each season, past harvest trends would be evaluated to determine whether management action is necessary prior to the upcoming season. If harvests substantially exceeded the harvest guideline in an area, restrictions would be applied during the upcoming season to reduce harvests below the guideline harvest level. Likewise, if harvest fell well below harvest guidelines, restrictions would be eased prior to the upcoming season.

In 2000 and 2001, a series of bag limit reductions and minimum length regulations were implemented by emergency order. These regulations were projected to decrease the weight of lingcod harvest from 25 to 55% (depending on the area and year). However, the regulations established in 2000 and 2001 were ineffective in reducing sport harvest to the guideline harvest levels (Figure 7). The number of lingcod harvested in northern Southeast declined, but the average weight of lingcod increased substantially. As a result, the estimated harvest in CSEO/NSEO, SSEO, and NSEI exceeded the allocations for those areas.

Prior to the 2002 season, we projected the 2001 harvest using logbook and creel survey information to improve our ability to estimate the harvest reductions needed. We estimated that, to stay within guideline harvest levels, the 2002 harvest in the Central and Northern Southeast Outside Sections, Southern Southeast Outside, and Northern Southeast Inside Sections needed to be reduced by 50%. Because minimum length limits were ineffective the prior two years, we chose a seasonal closed period as the primary mechanism to reduce harvest. We reasoned that harvest opportunity lost as a result of a closure would not be as easily replaced as harvest opportunity lost as a result of a minimum size limit. The specific regulations implemented by Emergency Order included: a closure to fishing from June 16 through August 15 in northern Southeast Alaska and along the outer coast of prince of Wales Island; a bag limit of one lingcod and a possession limit of 2 lingcod for all anglers; and a slot limit (30-inch minimum and 40-inch

**Table 1.—Sport harvest of treaty chinook salmon and sport overage/underage calculated using allocations based on the pre- and post-season abundance indices, 2000–2002.**

	Preseason	Post-season
<b>Year = 2000</b>		
Abundance index	1.14	1.10
All-gear quota	189,940	178,500
Combined troll/sport allocation	173,173	162,225
20% sport fishery allocation	34,627	32,445
Actual sport harvest	41,439	41,439
Percent of combined allocation	24%	26%
Sport overage/underage	6,812	8,994
<b>Year = 2001</b>		
Abundance index	1.14	1.29
All-gear quota	189,940	250,260
Combined troll/sport allocation	173,173	230,900
20% sport fishery allocation	34,627	46,180
Actual sport harvest	44,725	44,725
Percent of combined allocation	26%	19%
Sport overage/underage	10,098	(1,455)
<b>Year = 2002</b>		
Abundance index	1.74	1.74
All-gear quota	356,464	356,464
Combined troll/sport allocation	332,536	332,536
20% sport fishery allocation	66,507	66,507
Actual sport harvest <sup>a</sup>	58,403	58,403
Percent of combined allocation <sup>a</sup>	18%	18%
Sport overage/underage <sup>a</sup>	(8,104)	(8,104)
<b>Cumulative overage: 2000–2002</b>	<b>8,806</b>	<b>(565)</b>

<sup>a</sup> The 2002 post-season abundance index will be calculated during winter 2003, whereas the final sport harvest estimate for 2002 (and cumulative overage estimate) will not be available until the statewide harvest survey estimates are completed during summer 2003.

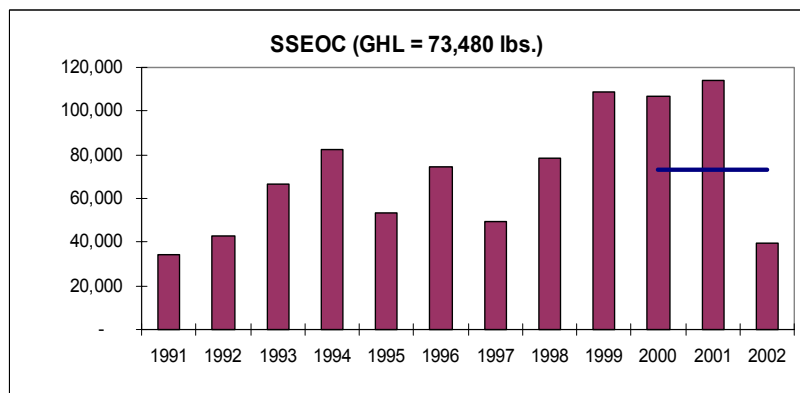
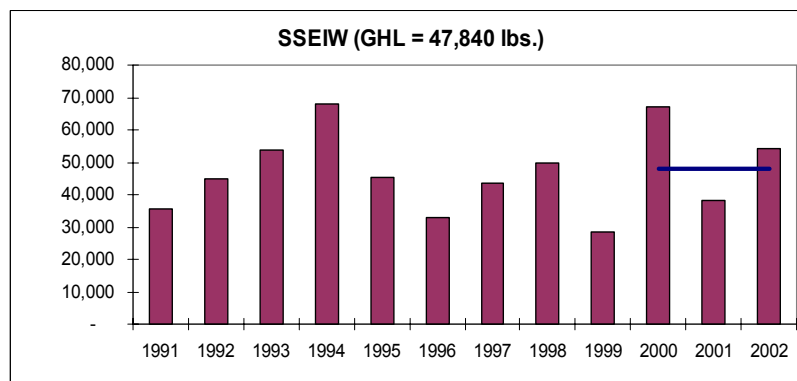
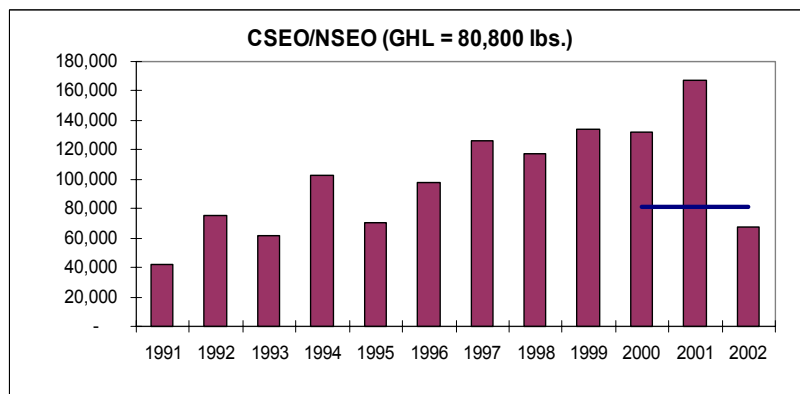
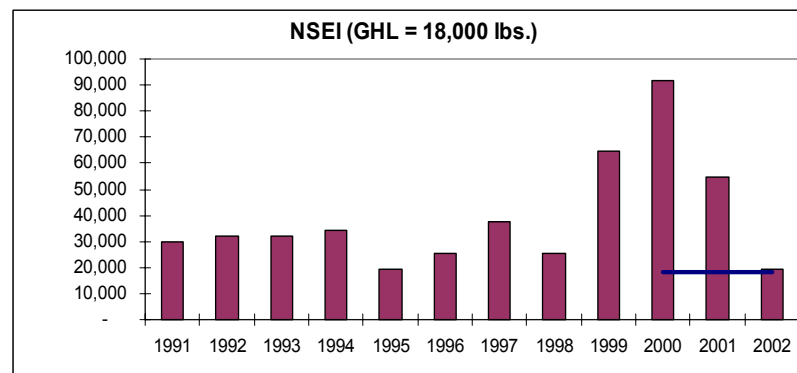
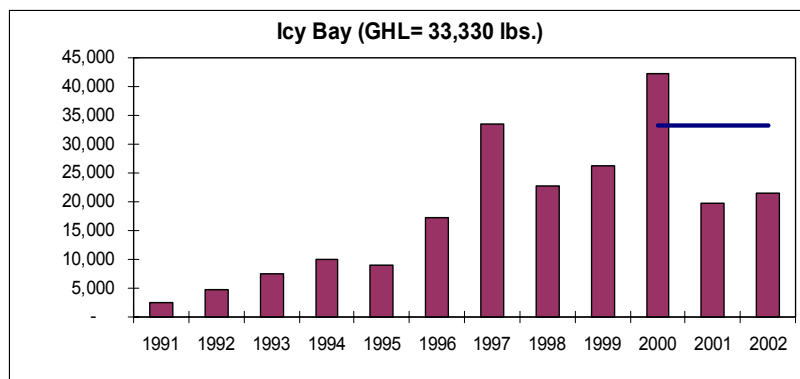
maximum for guided and nonresident anglers (1-05-02EO). In the Icy Bay area, near Yakutat, the limit was reduced to 1 per day and 2 in possession and a slot limit was established (32 inch minimum and 42 inch maximum) via Emergency Order (1-06-02EO). In addition, anglers returning to ports during times that creel sampling was occurring were not allowed to head or fillet their lingcod (1-03-02EO).

Based on projected harvest estimates for 2002, the midseason closed period, combined with the slot limit, appeared to reduce the sport harvest to near or below the GHL for each of the management areas (Figure 7). Harvest in NSEI and SSEI exceeded the GHL by 7% and 13%, respectively.

Harvest in the remaining areas was less than the GHL by 17% to 46%. The final 2002 harvest estimate will be available in fall 2003, when the 2002 SWHS harvest estimates are obtained.

#### **PROHIBITION ON HEADING OR FILLETING OF SALMON**

In 1998, the Board gave ADF&G the authority to prohibit heading or filleting of chinook and coho salmon during times and locations that department creel sampling programs were in operation. This regulation was intended to provide increased recoveries of coded wire tags (CWTs) implanted in chinook and coho salmon for estimation of the contributions of both wild and hatchery stocks.



**Figure 7.—Pounds of lingcod harvested in the sport fishery, by groundfish management area, and guideline harvest level (GHL) adopted by the Alaska Board of Fisheries.**

This was especially important for Alaska hatchery chinook salmon since these fish generally do not count toward the annual PSC quota.

Since 1998, enactment of this regulation, in combination with increased catch sampling efforts, increased sampling rates for chinook salmon from 18% in 1994 to near 30%. Coho sampling rates increased from 15% in 1997 to over 30% in subsequent years. The heading and filleting regulation was again enacted in 2002 for marine boat anglers returning to any harbor or boat launch connected to the following ports during the following time periods (1-03-02EO):

**Ketchikan, Sitka:** April 29–September 29

**Juneau:** April 19–September 29

**Craig, Klawock:** May 6–September 15

**Petersburg:** May 6–July 7

**Haines:** May 6–June 30

**Wrangell:** April 29–June 30

**Gustavus:** June 1–September 15

Via this emergency order, anglers were allowed to gut and gill chinook and coho salmon before returning to port, and anglers could fillet and head chinook and coho salmon on their boats once they had returned to a docking facility and tied their boat up to a float.

## BUSINESS AND GUIDE REGISTRATION

Businesses providing sport fishing services and sport fishing guides have been required to register with the department since 1998. During that five-year period the number of registered businesses with inseason mailing addresses in Southeast (and

therefore assumed to be operating in SE Alaska) has declined 19% from a high of 628 in 2000 to 508 in 2002 (Table 2). The number of registered guides has remained relatively stable at about 950. In 2002, 563 businesses indicated that they would be providing saltwater guiding services in Southeast, while only 366 indicated that they would be guiding in fresh water

## CHARTER VESSEL REGISTRATION AND LICENSING

Since 1982, when charter vessel registration was first required by ADF&G, the number of registered charter vessels within Southeast Alaska has increased (Table 3 and Figure 8). In 1986, the number of registered charter vessels decreased due to a regulation change that eliminated registration requirements for vessels that did not have an operator for hire (dry rentals) or were used in freshwater. From 1986 through 1997, however, the number of charter vessels increased annually to a peak in 1997 of 979 charter vessels.

In 1998, the ADF&G vessel registration process was replaced with the licensing process conducted by the Commercial Fisheries Entry Commission (CFEC). Since CFEC also requires freshwater vessels for hire to be licensed as well as vessels used only for transporting guided anglers to shore, some of the increase in vessel registrations since 1998 is due to these changes. Another part of the increase during the last few years may be due to operators registering or licensing their vessel under the perception that charter vessels might be subject to a future limited entry program or moratorium. Since 1998, the number of vessels registered with home ports in Southeast Alaska has remained relatively constant at about 1,250.

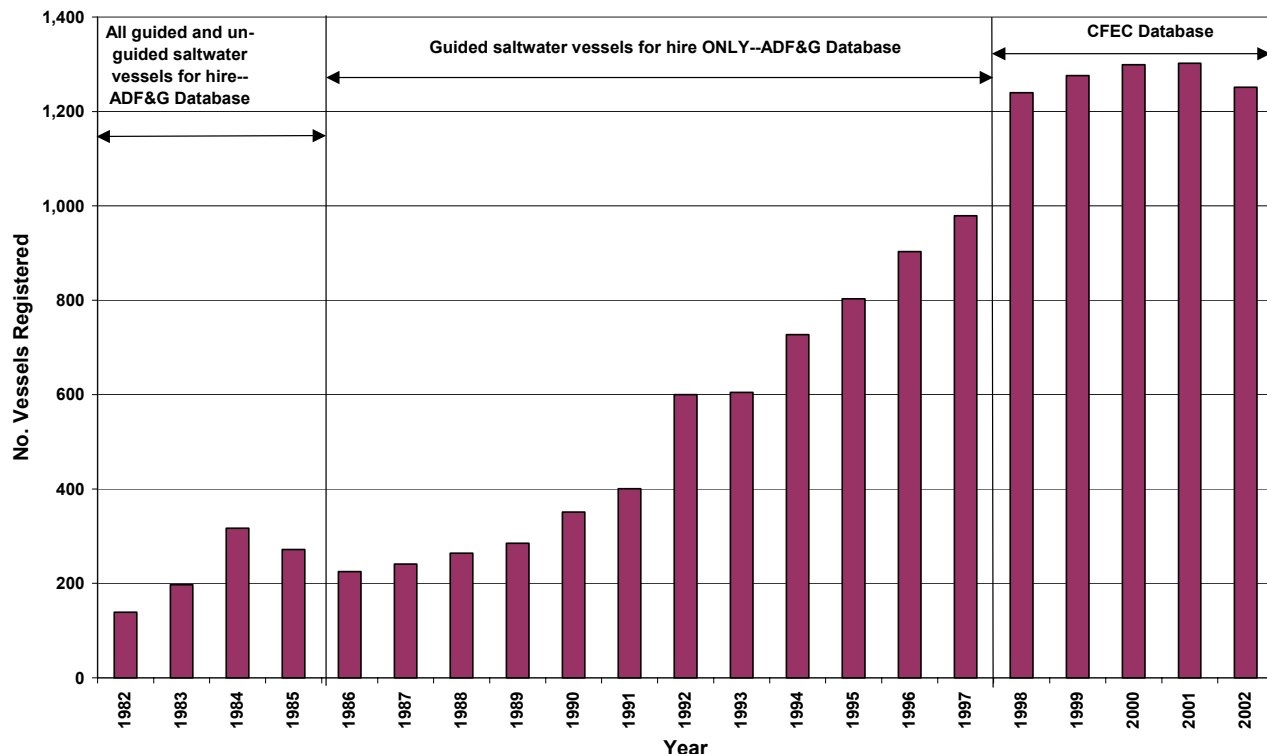
**Table 2.—Fishing service businesses and guides registered in Southeast Alaska, 1998–2002.**

	1998	1999	2000	2001	2002	Average 1998–2002
Registered businesses	576	618	628	550	508	576
Registered guides	818	958	951	954	961	928
Saltwater businesses	589	669	646	601	563	614
Freshwater businesses	na	423	424	380	366	398

**Table 3.—Number of registered (or licensed) charter vessels in Southeast Alaska by port from 1983 to 2002** (2002 data are preliminary). Registration requirements were changed in 1998 to include vessels used in fresh water as well as those used only to transport anglers.

Area/port	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Angoon	—	—	0	0	1	4	4	12	4	22	23	23	29	35	37	27	42	37	37	29
Elfin Cove	—	—	0	9	7	9	8	9	7	18	15	20	19	31	34	37	36	39	39	39
Gustavus	—	—	0	8	9	9	13	11	15	17	17	24	22	21	25	35	37	35	36	31
Haines	—	3	4	2	5	7	6	9	6	7	9	11	9	13	11	25	26	26	27	32
Hoonah	—	—	0	3	3	7	4	5	6	7	7	12	11	14	13	22	19	16	18	16
Juneau	22	60	43	47	47	47	40	54	52	80	71	115	112	147	154	207	191	199	181	160
Ketchikan	52	76	76	65	69	64	67	102	137	199	176	164	195	155	191	188	204	199	224	220
Pelican	—	—	—	1	5	7	5	4	5	7	3	5	6	9	12	19	22	25	24	21
Petersburg	69	97	72	5	4	8	11	13	22	28	40	35	45	59	49	62	62	64	64	59
PWI	—	—	—	32	34	34	40	44	45	67	73	94	101	143	167	210	221	226	216	199
Sitka	13	81	30	27	38	37	52	56	67	109	135	162	194	195	198	240	255	269	270	279
Wrangell	21	<sup>a</sup>	15	21	12	27	24	20	19	19	17	35	31	37	46	57	54	51	48	49
Yakutat	0	0	1	5	7	3	9	11	8	12	9	15	17	33	16	50	57	54	58	63
Other	20	0	31	0	0	1	2	1	8	8	10	12	12	11	26	61	50	59	60	54
TOTAL	197	317	272	225	241	264	285	351	401	600	605	727	803	903	979	1,240	1,276	1,299	1,302	1,251

<sup>a</sup> Wrangell included with Petersburg.



**Figure 8.—Number of charter vessels registered in Southeast Alaska, 1982–2002.**

### CHARTER LOGBOOK PROGRAM

In 1998, a saltwater charter vessel logbook program was implemented which required all charter vessels operating in salt water with a guide to obtain and complete a logbook. Summary data from the logbook program show that slightly more than 50% of licensed vessels reported taking clients on charter fishing trips (Table 4). Since 1999, the number of active permits has remained stable at about 670. On average, about 34% of the active vessels reported their port was in the Sitka area, 23% in the Prince of Wales Island (PWI) area, and 18% in the Juneau area (Table 4).

In 2002, forms were received from 651 vessels documenting marine charter boat sport fishing activities in Southeast Alaska during 2002. This was a decrease of about 4% from the number of active vessels (676) in Southeast Alaska in 2001.

The distribution of reported logbook effort and harvest by mail survey area confirms that Sitka is the most heavily fished area by charter anglers in Southeast Alaska (Table 5). Overall, charter

clients expended 105,583 angler-days of salmon fishing effort and 55,109 angler-days of bottomfishing effort (many fished for both targets on a given day) in Southeast Alaska. This was a decrease of 5% in salmon fishing effort and a decrease of 23% in bottomfishing effort from that reported in 2001. Reported harvests included about 45,100 chinook salmon, 153,100 coho salmon, 54,500 pink salmon, 4,400 lingcod, and 36,500 rockfish. Chinook and pink salmon harvests were greater than those reported for 2001 while there was a decrease in reported harvests of coho salmon, lingcod and rockfish.

### PACIFIC HALIBUT MANAGEMENT

#### Guideline Harvest Level

In February 2000, the NPFMC adopted Guideline Harvest Levels (GHL) for the charter vessel fleets in IPHC Areas 2C and 3A after review and evaluation of written and oral testimony. Each GHL was based on 125% of the 1995–1999 average halibut harvest (biomass in pounds) by the guided fishery as determined by numbers of fish estimated

**Table 4.—Overall number of active charter vessels in Southeast Alaska by Statewide Harvest Survey area determined from logbook data collected in 1998–2002** (2002 data are preliminary). Active vessels are those that turned in logbook forms reporting at least 1 trip with clients.

SWHS area	Year					Average	Percent of total
	1998	1999	2000	2001	2002		
Ketchikan	102	110	118	136	130	119	18%
Prince of Wales Island	123	165	172	157	152	154	23%
Petersburg/Wrangell	52	72	80	79	58	68	10%
Sitka <sup>a</sup>	231	242	218	216	216	225	34%
Juneau	119	126	146	114	114	128	19%
Haines/Skagway	15	20	21	16	15	17	3%
Glacier Bay <sup>a</sup>	37	36	97	88	80	68	10%
Yakutat	17	12	14	15	13	14	2%
<b>Total<sup>b</sup></b>	618	663	699	676	651	667	
<b>Percent of licensed vessels active</b>	50%	52%	54%	52%	51%		

<sup>a</sup> Beginning in 2000, the northern section of Chichagof Island (including Pelican, Elfin Cove, Hoonah, and the southern half of Icy Strait and Cross Sound) was re-assigned to SWHS Area G (Glacier Bay) and removed from SWHS Area D (Sitka). This was the primary reason for the dramatic increase in active vessels for Glacier Bay area and decrease in active vessels for the Sitka area between 1999 and 2000.

<sup>b</sup> Total values for Southeast Alaska charter vessels are lower than the actual column total because a unique vessel may have operated or offloaded fish and/or clients in more than one SWHS area during a given year.

**Table 5.—Marine charter logbook effort and harvest by clients by mail survey area for Southeast Alaska (based on area fished), 2002.**

Mail survey area	Client angler-days <sup>a</sup>		Harvests of important species					
	Salmon	Bottomfish	Chinook salmon	Coho salmon	Pink salmon	Pacific halibut	Lingcod	Rockfish
Ketchikan	24,046	4,589	4,956	22,914	32,288	n/a	314	3,335
Prince of Wales I.	20,853	12,699	11,293	44,559	8,974	n/a	1,179	11,909
Petersburg/Wrangell	1,848	2,499	831	2,846	274	n/a	12	559
Sitka <sup>b</sup>	34,508	21,790	20,054	51,918	6,224	n/a	1,757	14,082
Juneau	12,150	4,556	2,828	15,821	4,985	n/a	112	3,178
Haines/Skagway	2,943	100	213	26	21	n/a	0	10
Glacier Bay <sup>b</sup>	7,488	6,576	2,708	10,274	1,613	n/a	359	2,621
Yakutat	1,768	2,229	542	4,641	25	n/a	647	827
<b>Total</b>	<b>105,584</b>	<b>55,101</b>	<b>45,072</b>	<b>153,062</b>	<b>54,524</b>	<b>n/a</b>	<b>4,380</b>	<b>36,521</b>
Change from 2001	–5%	–23%	11%	–31%	8%	n/a	–47%	–12%

<sup>a</sup> Client angler-days for salmon and bottomfish should not be summed because many anglers fish for both types of fish on the same trip. Summing across the two types of fisheries will produce an overestimate of total client angler-days fished.

<sup>b</sup> The northern boundary between the Sitka and Glacier Bay SWHS areas was revised in 2000 so that the size of the Glacier Bay area was significantly increased.

via the SWHS and average weights determined by onsite biological sampling. The 2001 GHL in IPHC Area 2C (Southeast Alaska south of Cape Spencer) was set at 1,432,000 lb, and would be reduced in future years in proportion to reductions in area abundance as determined by the IPHC.

The proposed rule to implement the GHL was published on January 28, 2002 (67 FR 3867). The original plan for implementation of the GHL was to monitor the halibut fishery guided harvest in each area each year. If harvest exceeded the GHL, harvest restrictions (trip limits, prohibiting retention by captain and crew, etc.) would be implemented the following year. Depending on the amount of reduction necessary, management measures would be reviewed and adjusted after evaluating the response of charter harvests to the management measures. These measures to reduce charter harvest would be implemented by "notification." The notification procedure would supersede the Administrative Procedures Act (APA) rulemaking process. However, recent evaluations by NOAA General Counsel, cast doubt upon the legality of implementing restrictions by notifications. The APA rulemaking procedure is a lengthy process and would greatly increase the amount of time between when the GHL is exceeded and the implementation of any harvest reductions. Because of these and other concerns, the status of the GHL, and when and how it will be implemented is unknown.

In 2001 the Statewide Harvest Survey estimated that 66,435 halibut were harvest by charter anglers in area 2C. Based on creel sampling, the average weight of halibut harvested by charter anglers was 20.2 lb, for a total harvest of 1,341,987 lb. This is 6% under the GHL of 1.43 million lb. However, based on creel sampling in 2002, the average weight of halibut harvested by charter clients increased to 26.1 lb. Assuming the number of fish harvest remains the same as in 2001, the GHL in Area 2C would have been exceeded by about 300,000 lb. Therefore, restrictions in 2003 would be necessary. However, since the GHL rule and procedures have not yet been implemented, the earliest that restrictions could occur would be 2004.

A summary of fishery performance statistics for monitored Pacific halibut fisheries in Southeast Alaska for 2002 can be found in a report presented to the IPHC (White and Jaenicke, *unpublished*).

## **Individual Fishery Quotas**

During the process of reviewing and analyzing the GHL alternatives in 1999, a select group of charter industry representatives was at work devising a proposal that would parallel the existing commercial IFQ system. Initial review on this amendment was heard in December 2000. Final action by the council occurred in April 2001 when they accepted an IFQ program for charter operators in IPAC areas 2C and 3A. Initial IFQ allocations will be based on data collected in the 1998 and 1999 Saltwater Charter Vessel Logbook administered by ADF&G. Charter businesses were required to be active in 2000 in order to qualify for the IFQ program.

NOAA General Counsel has given approval for NMFS to develop a proposed rule on the IFQ regulatory package. It is estimated that the rule could be written as early as 2003. However, NPFMC and NMFS have not yet determined how charter harvest would be monitored inseason under an IFQ program. One major hurdle is how to estimate harvest. The Statewide Harvest Survey estimates are not available soon enough to be useable for management and the state stopped collecting halibut harvest information via the logbook program because harvest estimates from the logbook were much higher than estimates obtained from the Statewide Harvest Survey and onsite creel censuses. It was concluded that charter operators were inflating their harvest estimates in anticipation of the IFQ system. NMFS is in the process of developing a contract to obtain inseason halibut harvest data from the charter fishery in Areas 2C and 3A.

## **Halibut Subsistence**

The council in October 2000 adopted subsistence regulations for halibut on a statewide basis. These regulations were adopted by the Secretary of Commerce and published in the Federal Register on April 15, 2003. They became effective on May 15, 2003.

In April 2002, the council approved "trailing amendments" to the subsistence halibut regulations. The amendments lower hook limits from 30 to 10 hooks per person in Kodiak, Cook Inlet, Prince William Sound and others. They also allow the 'stacking' of up to 30 hooks on a longline in these areas when three qualified persons are on the



boats. The recommendations are currently under review by NMFS, and proposed implementing rules may be published in the Federal Register in 2003 or 2004.

## **FEDERAL SUBSISTENCE MANAGEMENT**

Under delegation by the Federal Subsistence Board, the U.S. Forest Service (USFS) implemented four inseason management actions in 2002. Federal and non-federal (sport and subsistence) fisheries at Klag Bay Lake (1-25-02EO) and Salmon Lake (1-26-02EO) were closed concurrently by USFS and ADF&G because of poor sockeye returns. ADF&G also closed sport and subsistence fishing at Falls Lake (1-27-02EO) because of low sockeye salmon escapement. The fresh waters of Falls Lake are closed by federal regulation to all but federally qualified subsistence users. USFS took concurrent action to close the federally managed waters of Falls Lake to subsistence fishing as well. These closures, in which federal and state fishery managers took parallel action, were similar to coordinated action taken in 2000 at Salmon Lake and Redoubt Lake. Closures to all users at all three locations became effective July 24, 2002 in the lake drainages and adjacent saltwater areas.

The fourth inseason management action occurred on the Redoubt Lake system where sockeye returns had been well below normal for the prior three years. In 2000 and 2001, ADF&G and USFS implemented concurrent emergency orders to close the system to all fishing because returns represented <15% of the historic average escapement. In 2001, the federal board closed the fresh waters to harvest by all but federally qualified subsistence users. In 2002, ADF&G closed the saltwater areas near Redoubt Lake to sport fishing on June 21 (1-14-02EO), and the state subsistence fishery was managed conservatively. However, by mid-July, returns of sockeye salmon counted at the Redoubt weir were high enough to reopen the sport fishery with a 3-fish bag limit (1-24-02EO). On July 27, with escapement projected to be well above the historic average, the normal sport bag limit (6 per day) was restored via emergency order (1-28-02EO). USFS took concurrent action, on July 26, to reopen the sport fishery in all fresh waters flowing into and out of Redoubt Lake.

The Federal Subsistence Board published 27 regulatory proposals to change federal subsistence regulations for the 2003–2004 regulatory year; 7 proposals were specific to Southeast. The Southeast Regional Advisory Council met September 30–October 3, 2002 to deliberate each proposal, and on December 17–19, the Federal Subsistence Board acted on them, taking the following action on proposals affecting Southeast Alaska:

- Proposal FP03-20 sought to close all fresh waters and a portion of the marine waters near the mouth of Redoubt Lake and increase the harvest limit for sockeye salmon. The Board rejected the portion of the proposal that sought to extend federal jurisdiction into marine waters and close the fresh waters to non-federally qualified subsistence users. They deferred the decision on increasing the harvest limit until after the Board of Fisheries acted on a proposal to develop an escapement goal and management plan for the Redoubt Lake fisheries. The deferred component of the proposal will be taken up during the 2003-2004 Federal Board meeting.
- A proposal (FP03-21) to allow use of bait year-round for coho salmon was rejected. This proposal was opposed by state and federal staffs as well as the RAC.
- Proposals FP03-22–26 sought to modify steelhead regulations on Prince of Wales Island to provide more subsistence harvest opportunity. The federal board adopted a modified regulation that allowed additional harvest opportunity in the form of both a winter and spring steelhead fishery. The winter steelhead fishery will occur December 1 through February 28/29 with a 2 fish seasonal household limit and a 100 fish harvest cap for Prince of Wales Island. The summer fishery will be open March 1 through May 31. The harvest limit is 5 fish per household and the seasonal harvest cap is 600 fish minus the number taken in the winter fishery. Both fisheries require a permit that must be returned within 15 days of the close of the season. Other permit conditions and systems to receive special protection will be determined by the local manager in consultation with ADF&G. In recommending permit stipulations, the department's primary concern will be to minimize harvest on stream with small runs of steelhead.

## ENHANCEMENT

Hatchery chinook and coho salmon are released in large numbers in Southeast Alaska and provide substantial fishing opportunities for sport anglers. All enhancement programs in Southeast are conducted by private nonprofit hatcheries. Although Crystal Lake Hatchery is a Sport Fish Division facility, it has operated under contract by the Southern Southeast Regional Aquaculture Association (SSRAA) since July 1, 2000. Sport Fish Division also provides funding to SSRAA and Douglas Island Pink and Chum Inc. (DIPAC) to release chinook salmon in the Ketchikan and Juneau areas. Over the past 4 years, hatchery releases of chinook salmon have been fairly stable, ranging from 5.3 to 7.4 million smolts annually (Table 6). About 5.3 million chinook salmon

smolts were released in 2002 by hatcheries in Southeast Alaska. Of these, about 1.84 million were paid for by sport anglers. Chinook releases paid for by sport anglers included about 798,000 smolts in the Ketchikan area, 466,000 in the Petersburg area, 477,000 in the Juneau area, and 95,000 in Skagway. About 180,000 coho smolts released in the Petersburg area from Crystal Lake hatchery were also funded in part by sport anglers. Many chinook salmon taken in Southeast Alaska originate from hatcheries in British Columbia; others are taken from hatcheries in Washington and Oregon. Far fewer non-Alaskan hatchery coho salmon are also taken. Detailed estimates of hatchery contributions for Alaskan and non-Alaskan stocks taken by marine boat sport fisheries of Southeast Alaska appear in Hubartt et al. (*In prep.*).

**Table 6.—Number of hatchery-produced chinook salmon smolts released in Southeast Alaska by facility and location, 1999–2002.**

SWHS area	Terminal harvest area (THA)	Agency	Release site	Year released				Average 1999–2002	
				1999	2000	2001	2002		
RELEASES IN TERMINAL HARVEST AREAS									
Ketchikan	Mountain Point	KTHC	Ketchikan Cr 101-47	51,411	90,258	89,488	0	57,789	
		SSRAA	Herring Cove 101-45	741,929	779,750	782,650	689,634	748,491	
			Subtotal	793,340	870,008	872,138	689,634	806,280	
	Neets Bay	ADFG	Neets Bay 101-90	347,334	421,803	0	0	192,284	
		SSRAA	Long Lk 101-95	273,613	248,698	300,221	0	205,633	
		SSRAA	Neets Bay 101-90	194,133	0	416,329	452,644	265,777	
			Subtotal	815,080	670,501	716,550	452,644	663,694	
			Ketchikan total	1,608,420	1,540,509	1,588,688	1,142,278	1,469,974	
	Petersburg/ Wrangell	Wrangell Narrows	ADFG	Crystal Cr 106-44	670,915	713,569	0	0	346,121
			SSRAA	Crystal Cr 106-44	0	0	595,728	466,063	265,448
			Subtotal	670,915	713,569	595,728	466,063	611,569	
Earl West Cove		ADFG	Earl West Cov 107-40	364,405	441,038	0	0	201,361	
			Pbg/Wrg total	1,035,320	1,154,607	595,728	466,063	812,930	
Sitka	Hidden Falls	NSRAA	Kasnyku Bay 112-11	1,104,403	1,232,716	1,214,625	1,145,835	1,174,395	
	Silver Bay	NSRAA	Bear Cove 113-41	1,596,867	2,248,728	2,182,109	1,953,356	1,995,265	
		SJ	Crescent Bay 113-41	11,376	0	0	0	2,844	
		Sitka total	2,712,646	3,481,444	3,396,734	3,099,191	3,172,504		
	Juneau	Juneau	DIPAC	Auke Bay 111-50	173,207	0	157,393	85,040	103,910
DIPAC			Fish Cr 111-50	183,701	223,585	183,252	178,745	192,321	
DIPAC			Gastineau Ch 111-40	221,443	208,586	213,232	213,276	214,134	
			Juneau total	578,351	432,171	553,877	477,061	510,365	
Haines/ Skagway		Taiya Inlet	ADFG	Taiya Inlet 115-34	1,856	0	0	0	464
	DIPAC		Pullen Cr 115-34	0	91,618	32,123	95,386	54,782	
		Haines/Skagway total	1,856	91,618	32,123	95,386	55,246		
Total, all THA's				5,936,593	6,700,349	6,167,150	5,279,979	6,021,018	
OTHER RELEASES									
Sitka	none	NMFS	L Port Walter 109-10	106,520	134,096	108,826	0	87,361	
Ketchikan	none	MIC	Tamgas Cr	501,171	587,782	404,437	0	373,348	
	None	MIC	Tent Cr 101-25	0	0	152,500	0	38,125	
			Subtotal	501,171	587,782	556,937	0	411,473	
Wrangell	none	SSRAA	Anita Bay 107-30	0	0	369,647	0	92,412	
Non-THA Total				607,691	721,878	1,035,410	0	591,245	
TOTAL, ALL RELEASES				6,544,284	7,422,227	7,202,560	5,279,979	6,612,263	

KTHC = Ketchikan Tribal Hatchery Corporation; NSRAA = Northern Southeast Regional Aquaculture Association; SJ = Sheldon Jackson; MIC = Metlakatla Indian Corporation. Other abbreviations appear in text.

## AREA SPECIFIC PROGRAMS, ACTIONS AND ISSUES

### KETCHIKAN AREA

The Ketchikan management area includes all fresh-water and saltwater systems from the middle of the Cleveland Peninsula south to the Alaska/Canada border in Dixon Entrance (Figure 9). This area includes the communities of Ketchikan, Metlakatla, Meyers Chuck, and Hyder, and numerous islands—the largest of which are Revillagigedo, Annette, and Gravina. The major marine sport fisheries in the Ketchikan area are for chinook salmon, coho salmon, pink salmon, and bottomfish (Pacific halibut, rockfish, and lingcod). Major freshwater sport fisheries include steelhead, cutthroat trout, Dolly Varden, coho, pink, and sockeye salmon. Permanent Sport Fish management staff consists of a Fishery Biologist III, Stephen Hoffman, and Administrative Assistant III, Jodi Goffinet, both stationed in Ketchikan.

### Local Management and Research Programs

#### *Marine Creel*

The 2002 season marked the eleventh year of expanded marine creel surveys in the Ketchikan area. Four seasonal technicians were employed between late April and the end of September to interview anglers at major harbors and boat launches for harvest information and collection of coded wire tag (CWT) data. Estimates generated from this study indicated that anglers harvested 7,295 chinook salmon, 35,889 coho salmon, 52,133 pink salmon, 1,966 chum salmon, 22 sockeye salmon, 7,009 Pacific halibut, 617 lingcod and 3,627 rockfish during 2002 (Hubartt et al. *In prep.*). In addition, local anglers harvested 7,815 Dungeness crab and 126,880 shrimp. Overall, chinook, pink, and coho salmon, Dungeness crab, and shrimp harvests in 2000 were above the past 5-year average, while chum and sockeye salmon along with rockfish were below the 5-year average.

#### *Salmon Research*

Two major salmon research programs were active in the Ketchikan area in 2002. Chinook salmon research entailed inserting coded wire tags (CWTs) into juvenile chinook salmon prior to

leaving the Unuk River, adult escapement surveys, and adult mark-recapture studies in this drainage. The CWT studies were undertaken to determine fisheries interceptions and exploitation. Escapement surveys were conducted using helicopter for monitoring long-term trends, and mark-recapture studies were conducted to estimate total escapement. Coho salmon research on the Unuk River included marking of juvenile coho salmon with CWTs to determine fisheries interceptions, adult escapement surveys via helicopter for trend monitoring and mark-recapture studies of returning adults to estimate total escapement into the drainage. Similar studies on king and coho salmon were conducted in the Chickamin River drainage in 2002.

#### *Trout Research*

No trout research occurred in this area in 2002.

### Management Actions

#### *Ketchikan Creek Management*

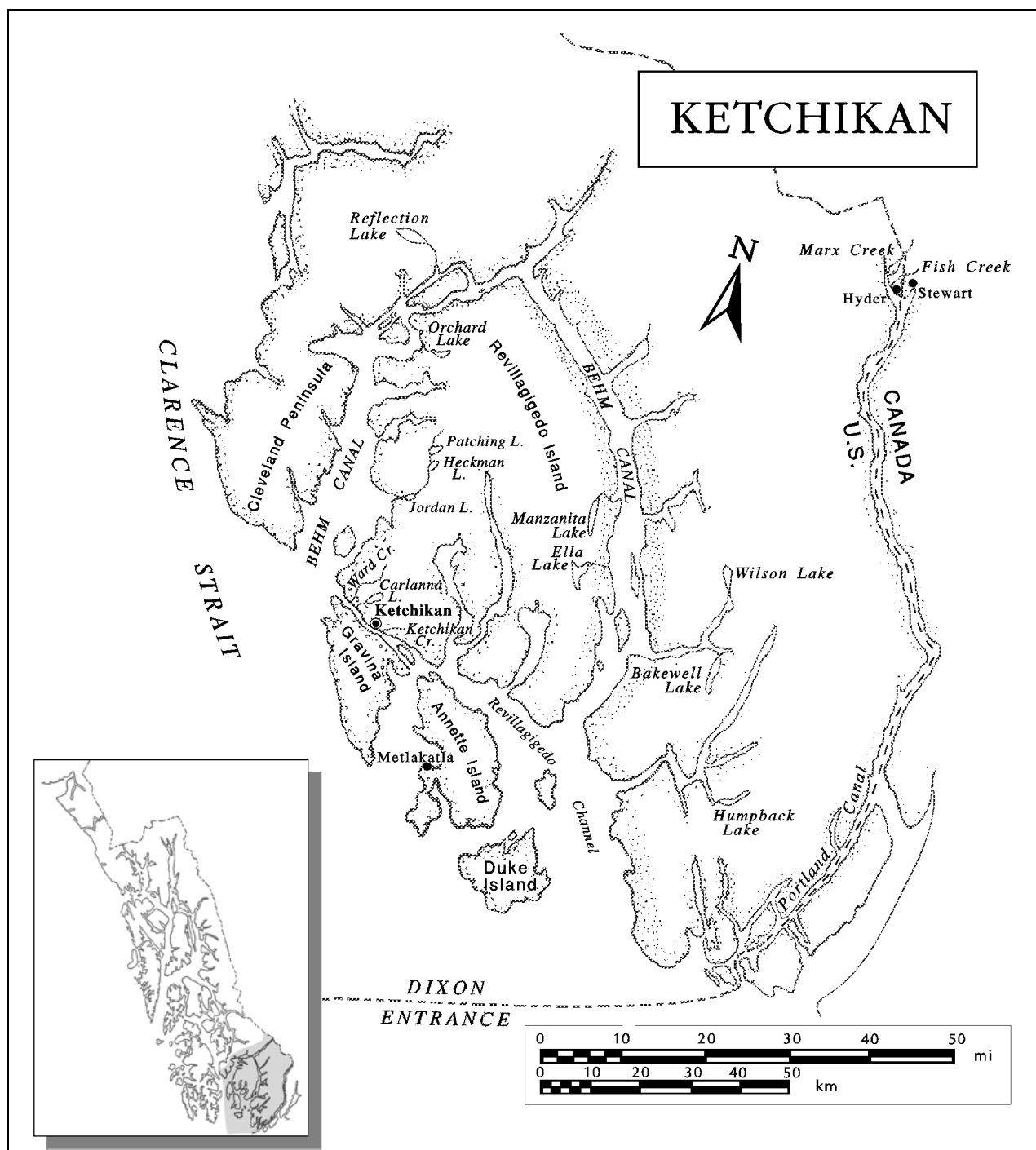
Ketchikan Creek is closed to sport fishing for all species from May 16 through September 14, by regulation. A below average return of hatchery chinook and coho salmon to the Deer Mountain hatchery prevented an early opening of Ketchikan despite an above average wild pink salmon return. Protection of chinook and coho salmon brood stock drove the decision not to open this fishery early.

#### *Pink Salmon*

The pink salmon bag limit in fresh and salt water located in the Ketchikan area was increased by emergency order to 12 fish per day and 24 in possession on July 13, 2002 (1-23-02EO). Above-average returns of wild stock pink salmon allowed expansion of limits for this species. The increased pink salmon bag and possession limits were in place from July 13 through October 31, 2002.

#### *Sockeye and Chum Salmon*

The sockeye and chum salmon bag and possession limits in fresh and saltwater located in the Ketchikan area was maintained at 6 per day and 12 in possession. Below average sockeye and chum salmon returns precluded expansion of sport limits.



**Figure 9.—Ketchikan management area.**

### *Chinook salmon*

The chinook salmon bag and possession limit was increased in two terminal areas near Ketchikan (Mountain Point and Neets Bay) to harvest

surplus hatchery produced fish from June 10 through July 31, 2002 (1-10-02EO). The bag and possession limit was increased to twelve king salmon of any size. In addition, the department implemented a personal use gillnet fishery for

Alaskan residents in the Herring Cove terminal harvest area 7 days per week between July 1 and July 31 (1-20-02EO). This fishery was opened to harvest surplus chinook salmon returning to the Whitman Lake hatchery (operated by SSRAA) located on Herring Cove Creek. Drift gillnets 60 feet or less was allowed with a limit of 50 chinook salmon of any size. These measures increased harvest and effort, but SSRAA reported that over 14,000 chinook salmon returned to the hatchery unharvested.

## Surveys

### *Salmon*

Chinook salmon escapement surveys were conducted by helicopter and/or foot on several area index streams to obtain yearly trend comparisons (Table 7). Escapement surveys in Ketchikan area chinook salmon index streams indicated escapements were up on three streams and lower on one stream. Survey counts on the Chickamin River were the highest since 1986 while the Keta River was the highest since 1991. The Blossom River was the only system, which did not reach its escapement goal range in 2002. Escapement to the Unuk River decreased from the high levels seen in 2000 and 2001, but was still within the escapement goal range.

Helicopter/foot/weir escapement surveys were also conducted on 16 of 17 coho salmon index streams in the Ketchikan area (Table 8). Coho salmon escapement counts in general were above the average for the prior five years (14 were above and 3 were below) in these index streams. Overall, coho escapements in the Ketchikan index streams averaged 188% of the prior five year average.

### *Steelhead*

Research conducted on steelhead in the Ketchikan area in 2002 consisted of repetitive snorkel surveys of adult escapement in 4 index streams. The counts are used to track escapement trends in area streams. Peak survey counts for 2002 in all four of the index streams showed a general decrease from 2001 totals (Table 9). Since snorkel surveys count a higher percentage of the total escapement, it can be misleading to compare 2002 data to foot counts made prior to 1997.

**Table 7.—Helicopter escapement survey peak counts of chinook salmon in Ketchikan area index systems, 1988–2002.**

Year	Blossom	Keta	Unuk	Chickamin
1988	384	575	1,746	786
1989	344	1,155	1,149	934
1990	257	606	591	564
1991	239	272	655	487
1992	150	217	874	346
1993	303	362	1,068	389
1994	161	306	711	388
1995	217	175	722	356
1996	220	297	1,167	422
1997	132	246	636	272
1998	91	106	840	391
1999	212	276	680	492
2000	231	300	1,341	801
2001	204	343	2,019	1,010
2002	224	411	899	1,013
Lower goal	250	250	650	450
Upper goal	500	500	1,400	900

## Enhancement

### *Chinook salmon*

This was the seventh year of a Cooperative Agreement (COOP-01-078) between ADF&G, Division of Sport Fish, and Southern Southeast Regional Aquaculture Association (SSRAA) to release chinook salmon smolts at their Neets Bay and Whitman Lake hatchery facilities. The goal of this agreement is to jointly finance the release of 700,000 chinook salmon smolts at Neets Bay (250,000 from SSRAA plus 450,000 from the division's Crystal Lake Hatchery in Petersburg) and 750,000 at Whitman Lake (SSRAA produced fish) to enhance local sport and commercial fisheries. At Neets Bay, 453,000 smolts were released in 2002; 257,000 fry were released into Long Lake (in Neets Bay), and 689,000 smolts at Whitman Lake. In 2002, 63% (4,651) of the chinook salmon harvested in the Ketchikan area sport fishery were of Alaska hatchery origin. Of these, 68% (3,159) were released at Neets Bay and Whitman Lake under the terms of the cooperative agreement with SSRAA.

In addition to chinook salmon releases from the cooperative project, the Deer Mountain hatchery,

**Table 8.—Annual peak coho survey count data for the Ketchikan area, 1993–2002. Streams shown were surveyed at least 4 of the last 10 years.** Distances surveyed or survey type vary between years on some streams.

Stream name	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	5-yr avg. (97–01)	2002 % of avg.	10-yr avg. (93–02)
Barrier Creek	325	175	220	230	NS	50	25	72	15	70	50	140	131
Blossom River	850	775	800	829	1,143	1,004	598	1,354	1,561	1,359	1,132	120	1,027
Carroll Creek	310	475	400	240	140	24	425	275	173	270	207	130	273
Choca Creek	300	225	180	220	175	190	225	180	450	220	244	90	237
Eulachon River	460	755	435	383	420	460	657	600	929	1,105	613	180	620
Fish Creek (Hyder)	29	496	95	465	258	502	818	923	1,229	2,094	746	281	691
Grant Creek	175	220	94	92	30	130	127	94	110	138	90	141	121
Herman Creek	90	265	250	94	75	94	75	135	80	88	92	96	125
Hugh Smith Creek	913	1,679	1,758	964	732	1,129	1,238	684	1,580	3,260	1,073	304	1,394
Humpback Creek	600	560	82	440	32	256	520	102	506	2,004	283	708	510
Humpy Creek	190	155	185	80	NS	NS	107	50	0	0	52	0	96
Indian Creek	475	560	600	570	100	304	356	380	1,140	940	456	206	543
Keta River	725	1,100	1,155	1,506	571	1,169	1,895	1,619	422	1,368	1,135	121	1,153
King Creek	110	325	415	457	55	411	627	620	891	700	521	134	461
Klahini River	50	200	165	40	60	120	150	110	151	20	118	17	107
Marten River	1,525	2,205	1,385	1,924	759	1,961	1,518	1,421	1,956	2,302	1,523	151	1,696
McDonald L	148	381	561	335	552	710	265	250	89	472	373	127	376
Reflection L	NS	116	42	312	NS	71	NS	NS	NS	NS	71		135
Tombstone River	1,275	850	2,446	1,806	847	666	840	1,672	505	1,639	906	171	1,255
<b>Mean</b>												188	

**Table 9.—Annual peak steelhead escapement counts for Ketchikan area streams, 1995–2002** (1995–1996 surveys were by foot; 1997–2002 surveys were snorkel surveys).

Stream name	1995	1996	1997	1998	1999	2000	2001	2002	Avg. 1997–2001	2003 % of 5-year avg.
White River	77	42	84	86	60	38	48	37	63	59
Ketchikan Creek	16	42	48	47	19	15	24	5	31	16
Naha River	33	37	20	31	49	NS	NS	NS		
Ward Creek	NS	NS	10	41	NS	NS	NS	NS		
McDonald Lake	66	60	145	86	100	47	74	17	90	19
Humpback Creek	27	20	91	24	4	7	101	94	45	209

NS = not surveyed.

owned and operated by Ketchikan Indian Corporation (KIC), released 133,000 chinook salmon smolts into Ketchikan Creek as part of its ongoing hatchery program. In 2002, releases from the Deer Mountain Hatchery program contributed 17 chinook salmon to the Ketchikan area sport fishery.

The Metlakatla Indian Corporation (MIC) operates the Tamgas Hatchery located on Annette Island Reserve south of Ketchikan. This facility releases 1.2 million chinook smolts each year to enhance island fisheries. The releases from this facility also contribute a significant to of fish to the Ketchikan area sport fishery. In 2002, 1,453

chinook salmon produced at Tamgas Hatchery were harvested in the Ketchikan area sport fishery.

### *Coho and Chum Salmon*

The division is not involved in either coho or chum salmon enhancement in the Ketchikan area. SSRAA released 3.5 million coho salmon at its Neets Bay and Whitman Lake facilities in 2002. Ketchikan Indian Corporation also funded releases of approximately 96,800 summer run coho salmon in Ketchikan Creek and 92,600 in Ward Lake. MIC's Tamgas hatchery released over 6.8 million coho salmon smolts paid for by MIC funding. All three of these programs benefit commercial and sport fisheries in the Ketchikan area. SSRAA also released 39.0 million summer-run and 15.0 million fall-run chum salmon at its Neets Bay facility in 2002. Chum returns from 1998–1999 releases were below average, and sport fishermen in the local area benefited very little from these releases.

### *Rainbow Trout and Steelhead*

The division is not involved in either rainbow trout or steelhead enhancement in the Ketchikan area other than to provide triploid rainbow trout eggs to KIC. These eggs are shipped to the Deer Mountain Hatchery where KIC raises them for release in the Ketchikan Creek City Park Kids Day fishery and to enhance the sport fisheries in Carlanna and Harriet Hunt lakes. In 2002, KIC released 2,100 triploid rainbows in the City Park Pond, 21,500 in Harriet Hunt Lake, and 5,800 fish in Carlanna Lake. KIC also released 8,900 steelhead fingerlings in Ketchikan Creek.

## **Access Projects**

In 2002, Ketchikan area staff were involved in review and/or development of one boat ramp project, one transient mooring float for yachts, one trail project, and one fishing pier project within the Ketchikan management area (Table 10).

## **Other Issues**

### *Hydroelectric Projects*

Division staff reviewed and made field inspection trips to five different hydroelectric projects in 2002 (Table 11). Considerable staff time was spent reviewing these projects, attending interagency meetings, and working with consultant firms involved with these projects.

### *Timber Harvest*

Logging activities continued to be planned or implemented in the Ketchikan area during 2002 (Table 12). Twelve different timber harvest plans were reviewed and comments provided to Habitat Division staff concerning potential impacts on various freshwater sport fisheries.

### *Federal Subsistence Fishery Management*

The federal government officially assumed management of freshwater systems on federal lands in 2000. Ketchikan area residents, with the exception of Saxman residents, are considered urban and therefore not eligible to participate in federal subsistence fisheries. Federal management of freshwater systems in the Ketchikan area in 2002 did not result in any restrictions to other user groups.

**Table 10.—Ketchikan area access projects, 2002.**

City/ Borough	Project title	Amenities	Type	Funding status	Cost	Status
Hyder	Hyder Boat Launch Improvements	Marine ramp, parking, float	B	FY 98	\$150,000	Out to bid by DOT in 2002
Ketchikan	Herring Cove Access Improvements	Trail	N	FY 99	\$174,000	on hold
Ketchikan	Thomas Basin Fishing Pier	Fishing dock	N	FY99	\$100,000	on hold
Ketchikan	Thomas Basin Yacht Transient	Float	B	FY02	\$150,000	on hold

B = boating; N = non-boating.

**Table 11.–Hydroelectric projects in the Ketchikan area, 2002.**

<b>Name</b>	<b>Status</b>	<b>Species of concern</b>
Ketchikan Lakes	Re-licensed with state and federal stipulations.	All species of salmon; steelhead; rainbow, brook, and cutthroat trout; and Dolly Varden in lake.
Connell Lake	1 <sup>st</sup> stage consultation. ADF&G drafting study needs. On hold	All species of salmon; steelhead; rainbow and cutthroat trout; Dolly Varden.
Whitman Lake	1 <sup>st</sup> stage consultation. ADF&G drafting study needs.	Dolly Varden, cutthroat trout
Mahoney Lake	Correctly licensed, awaiting construction, compliance monitoring. On hold	Sockeye, coho, pink, and chum salmon; steelhead; rainbow and cutthroat trout. Arctic grayling in upper Mahoney Lake
Swan Lake	Currently licensed, fisheries monitoring studies under review.	Dolly Varden, kokanee, cutthroat trout

**Table 12.–Ketchikan area timber harvest plans, 2002.**

<b>Name</b>	<b>Status</b>
Slide Ridge Timber Sale	EA scoping underway
Northside Timber Sale	EA scoping underway
Boundary Timber Sale	EA scoping underway
Southside Timber Sale	EA scoping underway
KRD Area Thinning Proposal	EA scoping underway
N. Revillagigedo Island	Timber harvest continuing
Upper Carroll Inlet	Timber sales released. Road construction in progress.
Sea Level – Thorne Arm	FEIS completed; sales being released
Emerald Bay	In USFS planning stage; ROD being contested by State
Gravina Island	In USFS planning stage; FEIS out soon
Licking Creek (Carroll Inlet)	DEIS out soon for review
Knot (salvage sale – Carroll Inlet)	EA completed
Several DNR timber sales	In planning phase
Ketchikan Gateway Borough	Timber sale completed; roads to be “put to bed soon”
Sealaska – Cleveland Peninsula	In planning phase; LTF permit renewed with herring stips.
Salty Timber Sale (USFS – George Inlet)	EA completed, sale area active
Mahoney Lake (Cape Fox Corp.)	Road constructed; logging completed 12/99, except for helicopter units
Clover Passage (Cape Fox Corp.)	Road construction beginning.
Rainbow Creek (Cape Fox Corp.)	Roads constructed; logging completed 8/99, except for helicopter units



## PRINCE OF WALES ISLAND AREA

The Prince of Wales Island (PWI) management area includes all freshwater systems draining Prince of Wales Island and a number of adjacent smaller islands (Figure 10). The major marine fisheries of the area are for chinook salmon, coho salmon, pink salmon, and bottomfish (Pacific halibut, rockfish, and lingcod). Major freshwater sport fisheries include steelhead, cutthroat trout, Dolly Varden, coho salmon, pink salmon, and sockeye salmon. Permanent Sport Fish management staff consists of one Fishery Biologist II, Steven McCurdy, stationed in Craig. During 2002 Sport Fish Division moved office locations from Klawock to Craig. The current sport fish office is shared with the Habitat and Commercial Fish divisions and all three divisions share an Administrative Clerk II, Ann Marie Marble. The office move should provide better access and service to the public, and also make Sport Fish management more efficient.

### Local Management and Research Programs

#### *Marine Catch Sampling*

A marine coded-wire-tag (CWT) sampling project was operated for the eighth season on the west coast of PWI. Two technicians sampled harbors, boat launches, and lodges in Craig and Klawock from late April through mid-September to collect coded wire tag information from charter and non-charter anglers returning to port in these locations. Harvest estimates of the different species caught in marine waters off PWI are derived from the Statewide Harvest Survey (SWHS) and only in-season CWT and fishery performance data are collected by the technicians. The chinook and coho fisheries were each above average in 2002.

#### *Salmon Research*

A coho salmon research project was begun in fall 2001. The Chuck Creek project is a component of the new sentinel watershed monitoring program funded by the Southeast Alaska Sustainable Salmon Fund. Components of this project included capturing coho salmon smolts and tagging them with coded wire tags (CWTs), counting the number of returning adults past a weir each year, and evaluating habitat usage by

adult and juvenile coho salmon. In 2001, the coho salmon weir was installed and operated for the first time, and 1,350 adult coho salmon were counted past the weir. In 2002, field work included installing a smolt weir on the outlet stream of Chuck Lake and applying CWTs to coho smolt; 8,995 coho smolt were marked with CWTs in 2002. In addition, the adult weir was reinstalled and operated to monitor escapement; 2,189 adult coho and 637 coho jacks were counted past the adult weir in 2002. Seventy-five percent (75%) of all jacks counted in 2002 had been tagged with CWTs the previous spring as smolt; 2003 will be the first year with returning adults that were tagged with CWTs.

### Management Actions

One emergency order (1-17-02EO) was enacted in 2002 specific to the PWI area: on June 21, 2002 the Sweetwater drainage was closed to sport fishing for sockeye salmon. Concurrently, the Commercial Fisheries Division closed the personal use fishery for sockeye salmon in the Sweetwater drainage. This joint action was taken after monitoring of the sockeye run in Hatchery Creek indicated that the run size was potentially insufficient to meet escapement needs. Sport and personal use harvests had each increased dramatically on this fishery in recent years, due in part to improved access from a recently constructed USFS boardwalk leading to a series of waterfalls on Hatchery Creek. Sockeye salmon are extremely vulnerable to harvest at the base of these falls (particularly during periods of low flow). Sport Fish Division will continue to monitor this run and to work with the Commercial Fisheries Division to ensure that escapement needs are met.

### Escapement Surveys

#### *Coho Salmon*

Coho salmon escapements into 5 PWI streams were monitored by means of foot surveys (Table 13). Multiple foot surveys were conducted on '108' Creek, Shaheen Creek, Port St. Nicholas Creek, Maybeso Creek and Harris River. In past years the Harris River and Maybeso Creeks have been surveyed from a helicopter near the time of peak counts. Peak counts of coho escapement reflected a regionwide trend with counts well above average and in many cases at all-time highs.

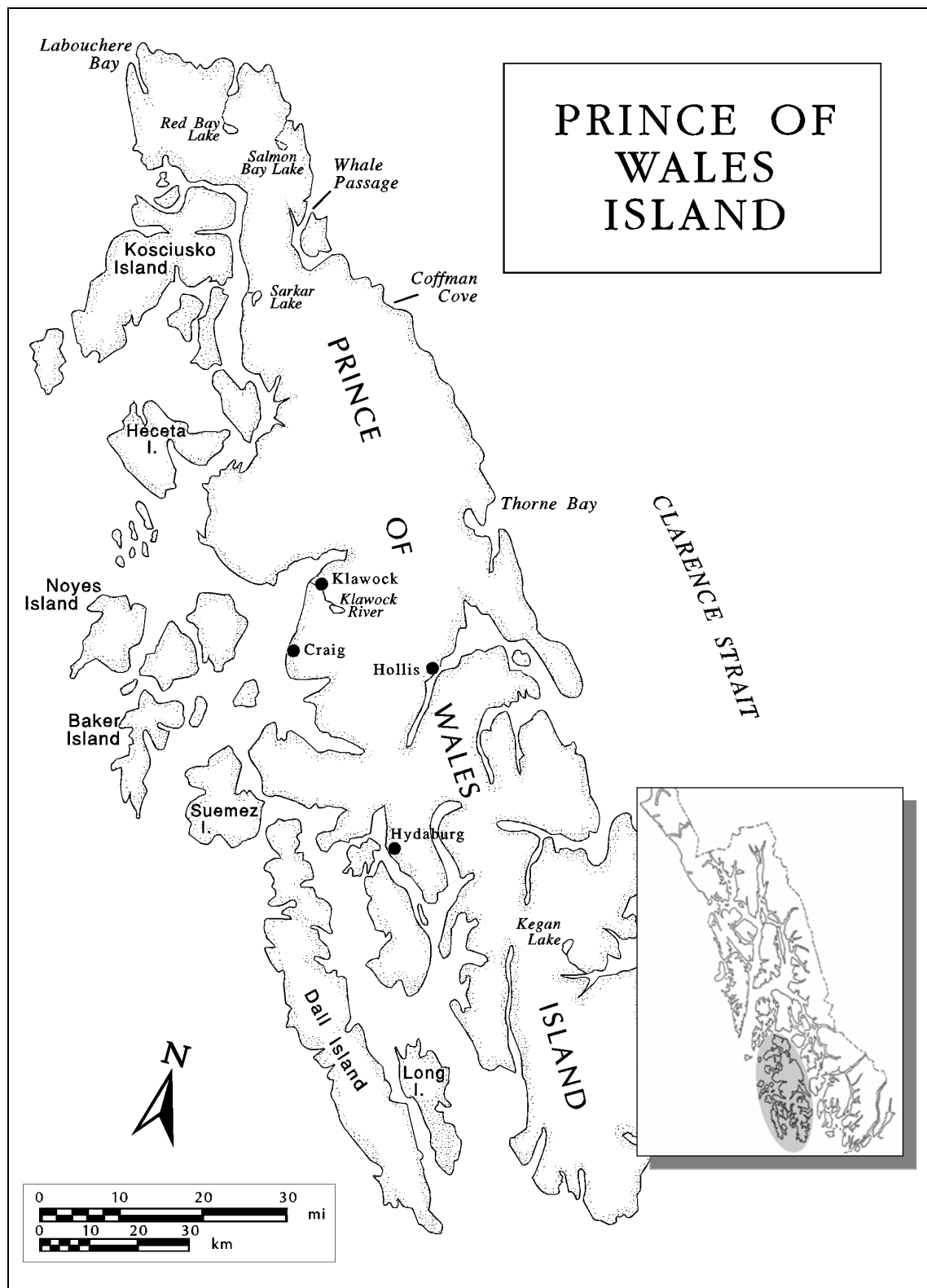


Figure 10.—Prince of Wales Island management area.

**Table 13.—Peak helicopter and foot survey counts of coho salmon escapement in Prince of Wales area streams, 1997–2002.**

Stream name (survey type)	1997	1998	1999	2000	2001	5 yr mean (1997– 2001)	2002	2002 % of mean
<b>‘108’ Creek</b> (foot)	163	242	163	151	301	204	759	372
<b>Harris River</b> (helicopter)	NS	839	321	851	633 <sup>F</sup>	661	838 <sup>F</sup>	127
<b>Maybeso River</b> (helicopter)	NS	81	183	186	62 <sup>F</sup>	128	360 <sup>F</sup>	281
<b>Port St. Nicholas Creek</b> (foot)	53	52	54	55	28	48	166	346
<b>Shaheen Creek</b> (foot)	63	153	155	135	25	94	157	167

<sup>F</sup> = foot; NS = not surveyed.

### *Steelhead*

Snorkel surveys to obtain peak spawner counts in two index streams (Harris River and Eagle Creek) were objectives of the PWI steelhead research project in 2002 (Table 14). Information derived from these surveys is used to monitor abundance trends in area streams. Since snorkel surveys count a higher percentage of the total escapement, it can be misleading to compare 2002 data to foot counts made prior to 1997. The Harris River peak count in 2002 (188 fish) was higher than the 5-year average. Survey conditions were excellent during the Harris River surveys (due to low, clear water) and a higher percentage of the total run probably was counted than in past years. Eagle Creek had the lowest peak count (36 fish) since snorkel surveys were begun.

### **Enhancement**

The department was not involved in enhancement on PWI in 2002. The Prince of Wales Island Hatchery Association (POWHA), which operates the Klawock Hatchery, released 2,066,162 coho salmon smolts, 510,140 sockeye salmon fry, 2,096 steelhead smolts, and 5,644 steelhead pre-smolts in 2002. A total (hatchery and wild fish) of approximately 40,897 coho and 14,078 sockeye salmon returned to the Klawock watershed in 2002. The return of hatchery steelhead was not documented in this stream in 2002. Approximately 62% of the coho salmon were hatchery produced (based on CWT data collected by the hatchery). The percentage of the total run composed of hatchery produced sockeye salmon is unknown.

**Table 14.—Peak snorkel survey counts of steelhead escapement in Prince of Wales Island area index systems, 1997–2002.**

Index system	1997	1998	1999	2000	2001	5 yr mean (1997– 2001)	2002	2002 % of mean
Eagle Creek	90	56	118 <sup>a</sup>	82	NS	86	36	42%
Harris River	104	156	192	79	100	126	188	149%

NS = not surveyed.

<sup>a</sup> Eagle Creek was closed to fishing because of low early snorkel counts and illegal harvest of steelhead early in the season during 1999.

SSRAA released 1,941,766 pre-smolt coho salmon into Neck Lake in 2001. These fish left the system as smolts in the spring of 2002. SSRAA also released 461,000 sockeye salmon smolts in the spring of 2002 into the outlet stream from Neck Lake. Anglers fish for coho returning to Neck Lake in both the outlet stream and in salt water.

### **Access Projects**

No access projects were conducted on PWI in 2002.

### **Habitat Issues**

#### *Water Use Projects*

PWI Sport Fish staff spent considerable time in 2002 reviewing and making field inspections of several operational and proposed hydroelectric projects on PWI. Field inspections were conducted at the Black Bear Lake hydro project, and the proposed hydroelectric project on the south fork of Black Bear Creek, as well as the proposed Three Mile Creek Klawock City water project. Numerous interagency meetings concerning these projects were also attended.

#### *Road Construction*

Sport Fish staff continued monitoring the federal highway Big Salt Road project in 2002 (17 miles of realignment and paving). Many bridge and culvert crossings were monitored throughout the year. Numerous water quality and fish passage problems continue to be addressed with this project.

### **Federal Subsistence**

Sport Fish staff continued to work with federal staff concerning federal subsistence regulations on PWI. Proposals to the Federal Subsistence Board (FSB) to liberalize subsistence harvest of steelhead were discussed with federal staff. Liberalized subsistence limits for PWI were passed by the federal Board in December 2002. These regulations will take effect beginning March 1, 2003. The FSB directed the federal managers of this steelhead fishery to consult with ADF&G concerning permit conditions and systems to receive special protection. Sport Fish staff will continue to advise federal staff on these issues and on the status of steelhead stocks.

### **PETERSBURG/WRANGELL AREA**

The Petersburg/Wrangell management area includes the islands of Kuiu, Kupreanof, Mitkof, Zarembo, Etolin, and Wrangell and all mainland waters in the vicinity of these islands (Figure 11). The area's major sport fisheries occur in marine waters for chinook and coho salmon along with bottomfish (Pacific halibut and rockfish). The major freshwater sport fisheries include chinook and coho salmon, steelhead, cutthroat trout, and Dolly Varden. Permanent Sport Fish management staff consists of one Fishery Biologist III, Doug Fleming, stationed in Petersburg.

### **Local Management and Research Programs**

#### *Salmon*

Salmon management and research plans focused primarily on wild chinook salmon stocks from the Stikine River, wild coho salmon at Slippery Creek (Kuiu Island), and local chinook salmon releases from Crystal Lake Hatchery at Blind Slough near Petersburg. Sport fisheries target wild stocks during late May and early June while hatchery returns peak near the end of June and early July in the Wrangell Narrows terminal harvest area.

The Stikine River is one of the two largest producers of chinook salmon in Southeast Alaska (Pahlke 1997). To track rebuilding efforts, a cooperative program that began in 1996 continued in 2002 between Sport Fish Division, the Canada Department of Fisheries and Oceans, and the Tahltan Band to estimate escapement and the inriver harvest rate of Stikine River chinook salmon.

In 2002, additional stock assessment programs using CWTs continued on the Stikine River to determine marine survival, smolt abundance, exploitation rate, and production of both chinook and coho salmon.

A stock assessment program for coho salmon at Slippery Creek on Kuiu Island that began in 1999 continued in 2002. This project is a cooperative project with the U.S. Forest Service and is one of several coho stock assessment programs ADF&G is developing to provide timely data about run strength for inseason management.

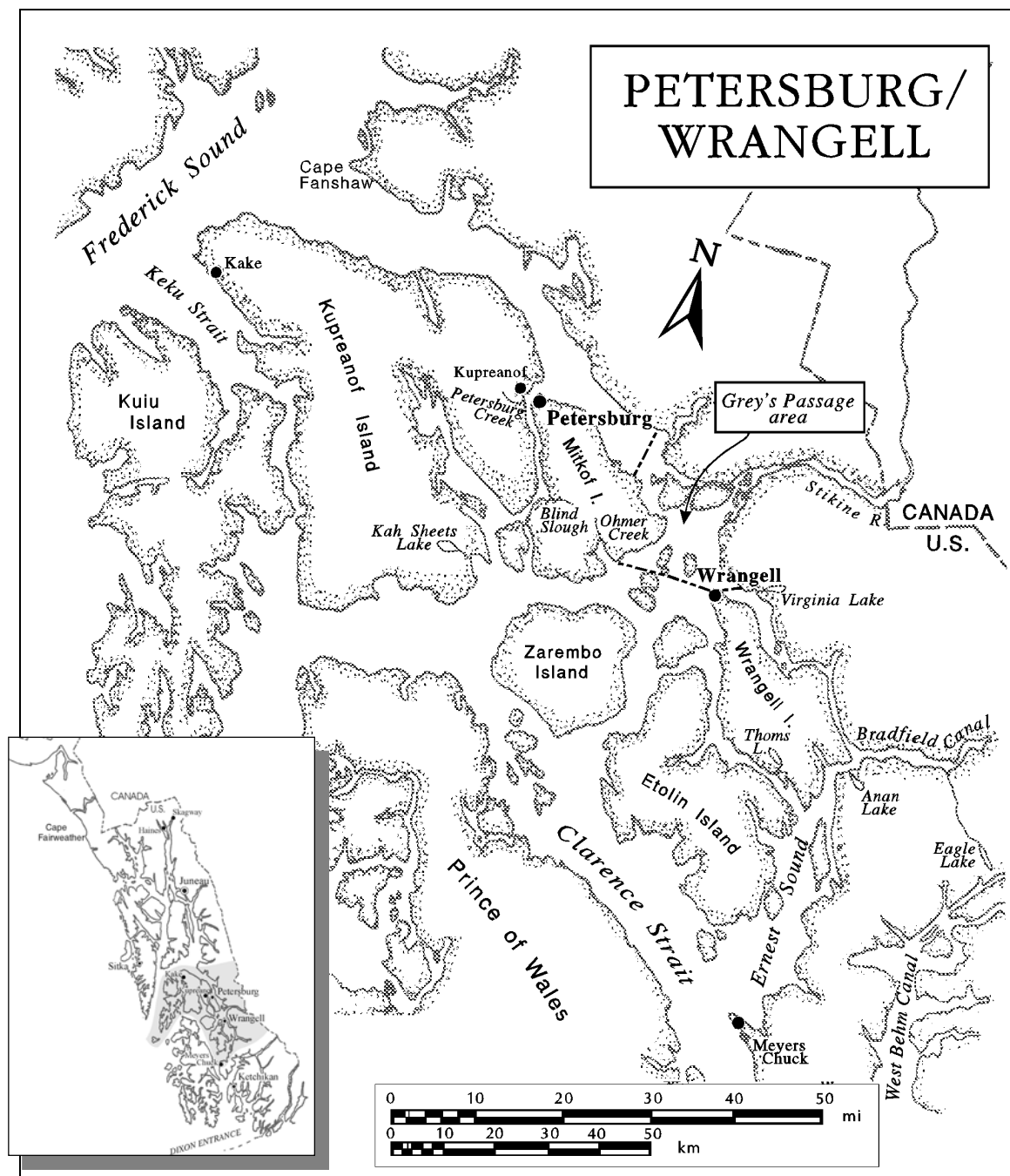


Figure 11.—Petersburg/Wrangell management area.

In spring of 2002, 15,869 coho salmon smolts were coded-wire-tagged below the lake outlet and sampled for age, length and weight. The 2002 adult escapement of coho salmon was monitored between mid-August and mid-October

to document the 2001–2002 smolt to adult run. Sport Fish technicians counted 5,341 adult coho salmon at the fish pass and found 2,431 to have missing adipose fins (Fleming, *unpublished.*).

A Fishery Data Series report titled “Production of Coho Salmon from Slippery Creek, 2000–2001” was prepared in 2002 and published early in 2003 (Beers 2003). The report details coho salmon production from the lake, including smolt abundance, harvest, exploitation rate, and total run.

### *Creel Census*

A dockside monitoring program (creel survey) to estimate Alaska hatchery chinook salmon contributions and track local catch rates in both Petersburg and Wrangell was continued in 2002 as part of the regionwide inseason chinook salmon management program. The preliminary 2002 harvest estimate of chinook salmon in Petersburg/Wrangell, based on the dockside creel, was 350 fish. The average harvest-per-unit-effort was about 48% higher than the previous 5-year average in Petersburg and 4% higher in Wrangell. Dockside coho salmon sampling was discontinued in 2001 at both Petersburg and Wrangell.

### *Trout*

A Federal subsistence fishing regulation was supported and passed allowing increased bag limits for Dolly Varden, cutthroat and rainbow trout from Virginia Lake, near Wrangell. The new bag limits for subsistence anglers with federal subsistence permits include the harvest of 10 Dolly Varden, of any size at any time, and six (6) cutthroat or rainbow trout in combination with the existing 11-inch to 22-inch slot size limit.

At a public meeting, the Wrangell Advisory Committee requested assistance in pursuing a near-to-town freshwater trout fishery with bait as a legal gear, as allowed in the SEAK Cutthroat and rainbow trout management plan [5AAC 47.045.].

## **Management Actions**

### *Wrangell Narrows Terminal Harvest Area Management*

A return of 7,353 chinook salmon was forecast for the terminal waters of Wrangell Narrows, which encompasses waters in section 6A south of 56° 46' N. latitude (Martinsen's dock) and east of the longitude of the northern tip of Woewodski Island. Under the Wrangell Narrows-Blind Slough Terminal Harvest Area Management Plan, the terminal waters of Wrangell Narrows were opened by emergency order to a bag limit of 4 chinook

salmon 28 inches or longer and 8 chinook salmon <28 inches in length June 1 through July 31 (1-08-02EO). The freshwater portion of the chinook sport fishery in Blind Slough is open all year. The sport bag limit in this area was increased to 4 chinook salmon 28 inches or longer and 4 chinook salmon <28 inches. Bait was allowed in Blind Slough starting June 15, and salmon hooked elsewhere than in the mouth could be retained.

On Friday, August 9, 2002 the chinook salmon sport fishery in Blind Slough was closed by emergency order (1-29-02EO). High water temperatures and low water levels in Blind Slough led to a die-off of approximately 590 prespawning chinook. This emergency order was undertaken to ensure adequate numbers of king salmon for the Crystal Lake hatchery brood stock needs. The action did not impair the sport fishery at the Blind River Rapids, as the run of returning coho salmon was building. At least 2,887 adult chinook salmon survived and were later counted at the Crystal Lake Hatchery at the time of the egg take.

## **Surveys**

Sport Fish staff are responsible for adult steelhead surveys and insuring enough adult coho and chinook salmon are available to maintain broodstock at Crystal Lake Hatchery, while Commercial Fisheries staff conducted coho salmon surveys.

### *Petersburg Creek*

Two weekly snorkel surveys for adult steelhead were conducted on May 7 and May 20. A peak count of 41 fish was observed on May 20 with normal visibility and low water conditions. Late spring ice conditions and high water levels delayed the onset of counts during late April and in early May.

### *Slippery Creek*

Two snorkel surveys for adult steelhead were conducted (May 9 and May 15). A peak count of 31 fish was observed on May 9 with excellent visibility and water conditions. Similar to Petersburg Creek, the late ice-out at Slippery Lake precluded early season counts.

## **Enhancement**

SSRAA continued operation of Crystal Lake Hatchery, which was the last state-owned and

operated hatchery in Southeast Alaska. The hatchery will be fully funded through FY2005, with a combination of state funding, SSRAA, and Southeast Sustainable Salmon funding.

Crystal Lake Hatchery chinook salmon returns are allocated between commercial and sport user groups under the terms of the Wrangell Narrows-Blind Slough Terminal Harvest Area Management Plan (5 AAC 33.381). During years of low expected returns, the entire run (in excess of those needed for egg takes) is allocated to the sport fishery. At higher projected returns the commercial fisheries take an increasingly large share of the harvest. On average the sport fishery has harvested 55% of the chinook salmon returning to Crystal Lake since 1995 (Table 15).

In 2002, 4,500 adult chinook salmon were allocated to the marine boat fishery, shoreline fishery, and broodstock maintenance; the commercial fishery was allocated 500 chinook salmon. About 1,000 chinook salmon are required for broodstock maintenance to meet release goals at Blind Slough (600,000 smolts) and Anita Bay (400,000 smolts). Both releases are Andrew Creek broodstock. In 2002, a total of 565,240 chinook smolt were released into Crystal Creek but no chinook were released at Anita Bay

due to insufficient numbers of smolt surviving an outbreak of Bacterial Gill Disease.

The hatchery also maintains a small coho release program, using Crystal Creek stock, to mitigate loss of coho salmon spawning habitat caused by the construction of Crystal Creek Hatchery. The updated release goal is 150,000 coho smolts each year. In 2002, there were 178,400 coho smolt released into Crystal Creek. The coho salmon produced at Crystal Lake Hatchery are caught in salt water and fresh water terminal harvest areas. Since 1995, the average sport fishery harvest has been 809 coho salmon (Table 16). The 2002 escapement of Crystal Creek coho was 3,095 fish.

### Access Projects

The Division of Sport Fish received a proposal to build a boat ramp in Wrangell Harbor, near Shakes Island. The project proposal has been submitted on a CIP list for FY 04.

Currently there are no ongoing access projects in Petersburg; however, the division has been locally involved in a panel-driven process to allocate monies from a USFS-administered program for uses in the Petersburg and Wrangell communities. In October 2000, Congress passed Public Law 106-393 entitled "Secure Rural Schools and

**Table 15—Contributions of Crystal Lake hatchery chinook salmon to sport and commercial fisheries, 1995–2001.** Statewide harvest survey (SWHS) estimates not available for 2002, until fall 2003.

Year	Sport				Commercial			Percent sport
	Mixed saltwater boat <sup>a</sup>	Terminal Saltwater boat <sup>b</sup>	Terminal shoreline <sup>c</sup>	Sport total	Mixed stock <sup>d</sup>	Terminal <sup>e</sup>	Commercial Total	
1995	465	737	391	1,593	2,923	1,165	4,088	28
1996	474	1,867	672	3,013	3,807	1,933	5,740	34
1997 <sup>f</sup>	280	851	1,204	2,335	1,307	801	2,108	53
1998	257	968	774	1,999	1,181	0	1,181	63
1999	190	1,935	2,343	4,468	1,782	268	2,050	69
2000	476	2,563	2,000	5,039	2,316	1,329	3,645	58
2001	350	2,860	3,595	6,805	1,056	917	1,973	77

<sup>a</sup> Estimated from regionwide dockside creel sampling programs.

<sup>b</sup> SWHS estimate (includes adult and jack chinook salmon).

<sup>c</sup> SWHS estimate (includes both freshwater and estuary/saltwater shoreline adult and jack chinook harvest).

<sup>d</sup> Estimated from regionwide commercial port sampling programs.

<sup>e</sup> Fish ticket information.

<sup>f</sup> First year under the Wrangell Narrows/Blind Slough Terminal Harvest Area Management Plan.

**Table 16.—Contributions of Crystal Lake hatchery coho salmon to sport and commercial fisheries, 1995–2001.** Statewide harvest survey (SWHS) estimates not available for 2002, until fall 2003.

Year	Sport			Sport total	Commercial total <sup>d</sup>	Personal use total <sup>e</sup>	Percent sport
	Mixed saltwater boat <sup>a</sup>	Terminal saltwater boat <sup>b</sup>	Terminal shoreline <sup>c</sup>				
1995	0	704	915	1,619	975	198	58
1996	37	604	128	778	1,884	105	28
1997	158	147	384	805	2,202	177	25
1998	0	66	167	248	1,185	170	16
1999	39	1,270	415	570	5,365	115	9
2000	48	21	480	549	3,173	148	14
2001	88	0	1,005	1,093	2,030	365	31

<sup>a</sup> Estimated from regionwide dockside creel sampling programs.

<sup>b</sup> SWHS estimate.

<sup>c</sup> SWHS estimate (includes both freshwater and estuary/saltwater shoreline harvest).

<sup>d</sup> Estimated from regionwide commercial port sampling programs.

<sup>e</sup> Personal use harvest reports.

Community Self Determination Act of 2000” which stabilized federal payments to states for funding schools and roads. The new law commonly referred to as Payments to States replaces and fundamentally changes the way the USFS has been returning a portion of its annual receipts to jurisdictions falling within National Forest boundaries (“the 25 percent fund”).

Under this program, a Resource Advisory Committee (RAC) has been set up with residents from Petersburg and Wrangell who make or forward recommendations on how special project funds should be spent. The projects can encompass a broad range of maintenance and improvement work, such as roads and trails, watersheds, and fisheries and wildlife habitat on national forests or non-federal land where the project would benefit resources on federal land. One local project that has been identified and strongly supported is a \$140,000 project to rebuild the Banana Point wave attenuator that was initially constructed with Sport Fish access funds. Other projects under review include resurfacing the Blaquiére Point boat launch and installation of a remote, dial-up wind sensor near Banana and Blaquiére points to help recreating Petersburg and Wrangell mariners plan trips with greater safety. Several other projects have been identified in the two communities, but the fate of those will be determined in future 2003 meetings when additional information on project costs, land status, and public input becomes available.

## Other Issues

### *Subsistence*

In 2001, the Federal Subsistence Board passed a proposal allowing federal subsistence steelhead harvest fisheries to start in 2002 in Kadake Creek and the Hamilton River, near Kake. Fishers have been required to hold a federally issued permit to harvest steelhead, but no permits were issued in 2002. There has been no record of steelhead taken by subsistence harvest in these two drainages.

### *Habitat*

The City of Petersburg continued its relicensing process for the Blind Slough Hydroelectric Project (FERC Project No. P-201-AK). Staff from Divisions of Habitat and Sport Fish drafted the terms and conditions needed for protection of fish and wildlife under different operating conditions. Recently added conditions include developing contingent responses when flow interruptions occur, maintaining and monitoring adequate flows in Crystal Creek to sustain resident Dolly Varden populations, and facilitating higher test flow water releases to determine if flow augmentation can reduce potential chinook die-offs during periods of low rainfall when adults are returning to the hatchery. Other habitat-related activities included reviewing the U.S. Army Corps of Engineers proposal to reconstruct a water supply dam and associated structures on Gunnuk Creek at Kake.



## SITKA AREA

The Sitka Management Area includes all waters of Baranof Island, Yakobi Island, and Chichagof Island west of a line extending from Point Hayes to Column Point (Figure 12). Sitka (about 8,500 residents) is the only large community located within the Sitka Management Area. Smaller communities include Pelican, Baranof Warm Springs, and Port Alexander. The Sitka Management Area provides about 18% of the sport fishing effort in Southeast Alaska. Permanent Sport Fish management staff consists of one Fishery Biologist III, Robert Chadwick. The Regional Management Coordinator, Thomas Brookover, is also stationed in Sitka.

In terms of harvest, the Sitka area supports one of the largest marine sport fisheries in Alaska. According to the most recent Sport Fish State-wide Harvest Survey data, more chinook salmon were harvested in 2001 in the Sitka marine fishery than in any other fishery in Alaska. In 2001, marine angling constituted 95% of the sport fishing effort in the Sitka area. Marine sport fishing effort in the Sitka area has increased more rapidly than most other areas in Southeast Alaska, from about 40,000 angler-days in 1980 to over 105,000 in 1999. In 2001, 92,000 angler-days of effort were expended in the marine fishery. Freshwater fishing effort in the Sitka area increased from about 6,000 angler-days in 1987 to 8,400 angler-days in 1999, but has since declined to 4,700 in 2001.

### Local Management and Research Programs

#### *Marine Creel*

Five technicians were employed to conduct the creel survey of the Sitka marine boat fishery from April 29 to September 29, 2002. Sport anglers took a preliminary estimated harvest of 24,834 chinook salmon in the Sitka marine sport fishery. This is 18% above the recent 5-year average, represents the second largest harvest in the Sitka sport fishery, and composes an estimated 33% of the total sport harvest of chinook salmon in Southeast Alaska in 2002. Catch rates for chinook salmon in the Sitka marine fishery were outstanding for most of the 2002 season,

except during late April to late May when catch rates fell below average (M. Jaenicke, Alaska Department of Fish and Game, Douglas, personal communication). Alaska hatchery stocks contributed about 10% of the Sitka area harvest, slightly below the recent 5-year average of 11%. Medvejie Hatchery once again made up the majority (75%) of the Alaska hatchery chinook salmon contributions in the waters near Sitka in 2002. Non-Alaska hatcheries contributed about 20% of the Sitka chinook harvest, which is below the 5-year average of 30%. The origin of the non-Alaska hatchery contributions ( $n = 5,068$  fish) in the waters near Sitka was as follows: British Columbia, 57%; Washington, 28%; and Oregon, 15%.

Sport anglers took a preliminary estimated harvest of 46,150 coho salmon in the Sitka marine sport fishery. This is down 41% from 2001's record harvest of 78,218 fish and is 12% below the recent 5-year average in the Sitka marine sport fishery. From the beginning of June through the end of August, coho salmon catch rates near Sitka were generally below both the 5-year average and the high catch rates in 1999 and 2002. The catch rate in Sitka peaked during the third week of July and again in the first week in September. The hatchery contribution was 20% and was composed entirely of Alaska hatchery coho salmon production. Neets Bay stocks were again taken in large numbers, accounting for 40% of the hatchery coho salmon taken near Sitka. The next two largest coho salmon hatchery stocks to contribute to the Sitka marine fishery were Port Armstrong with 19% and Hidden Falls with 15%.

Most sport fishing effort for bottomfish was directed at areas outside of Sitka Sound due to guided anglers. Catch rates for Pacific halibut were excellent throughout the season and averaged about three angler-hours per halibut kept and were similar to the above-average catch rates experienced in 2002.

#### *Redoubt Lake and Bay Creel Survey*

Redoubt Lake supports populations of sockeye, pink, chum, and coho salmon as well as Dolly Varden, steelhead, and cutthroat trout. Sockeye salmon have been the focus of commercial, sport,

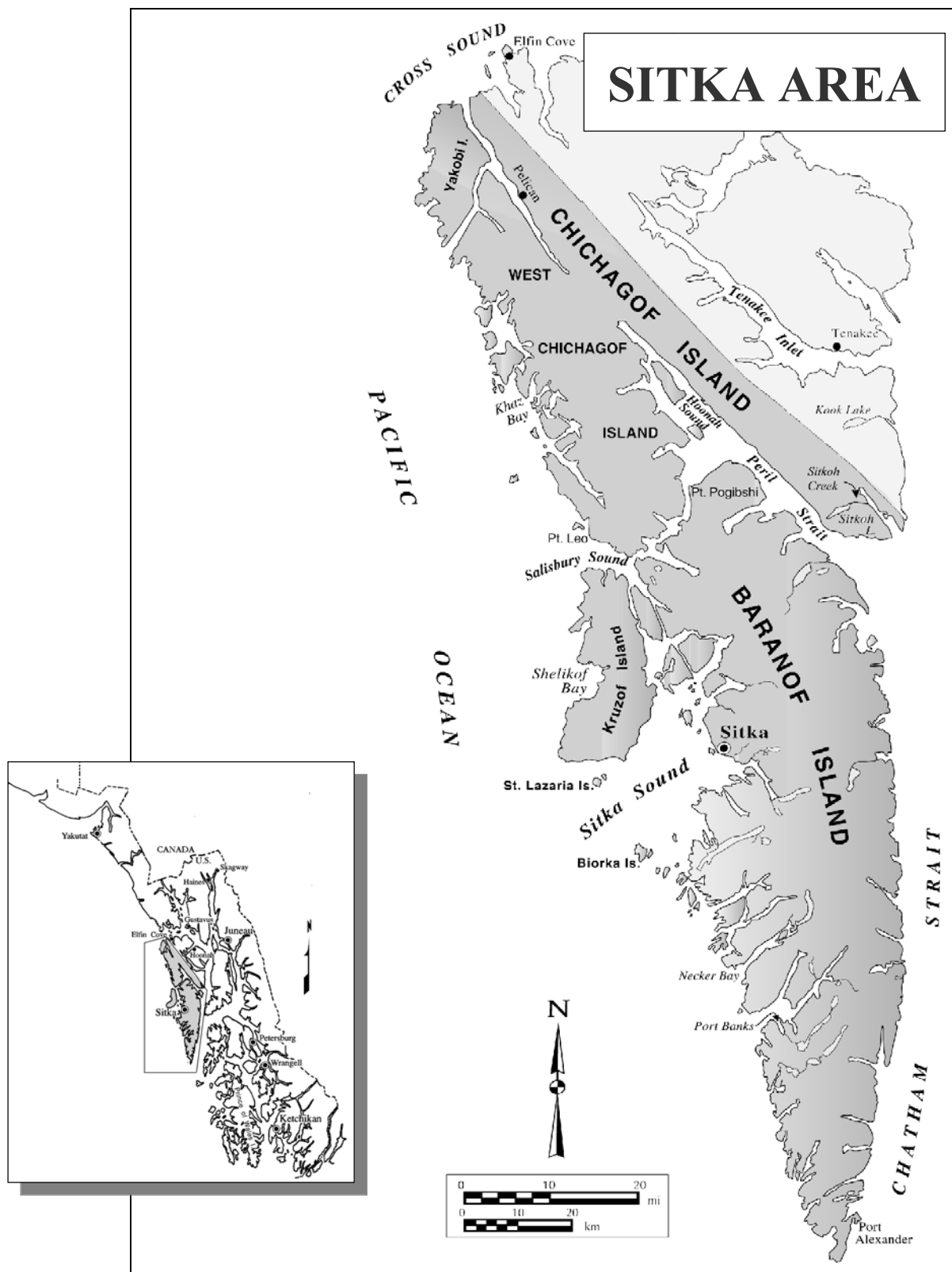


Figure 12.—Sitka management area.

and subsistence fisheries. Records dating from the early 1800s indicate that Redoubt Lake supported annual harvests in excess of 50,000 sockeye salmon during Russian occupation. Prior to 1999, Redoubt Lake sockeye returns supported the largest subsistence fishery in the Sitka Area and also supported a saltwater sport fishery at the head of Redoubt Bay. A few Redoubt sockeye salmon are probably also harvested incidentally by commercial troll, seine, and gillnet fisheries.

Subsistence harvest reports provide an index of subsistence fishing effort and harvest, but underestimate actual effort and harvest because, on average, about 20% of subsistence fishermen do not submit harvest reports. Sport harvests of sockeye salmon have been estimated for the Sitka area since 1977 through the Statewide Harvest Survey and via an the marine creel survey conducted for the port of Sitka since 1992. An onsite creel census has estimated sport fishing effort and harvest at Redoubt Bay since 1999.

By 1980, concern over Redoubt Lake sockeye salmon developed based on visual observations of low escapements. In 1984, the USFS, ADF&G, and Northern Southeast Aquaculture Association (NSRAA) joined in an effort to enhance sockeye production through lake fertilization. A weir operated in conjunction with the fertilization project provided escapement counts. Escapement counts increased from an average of 7,400 (1982–1988) to 37,600 fish (1989–1999) (Table 17). Fertilization efforts ended in 1997 but were resumed again in 1999.

Large returns to Redoubt Lake prior to 2000 contributed to an increase in annual subsistence and sport harvest of sockeye salmon at Redoubt Lake and Bay (Table 17). As marine sport fishing effort near Sitka has increased and regulations have become more restrictive, anglers have sought alternative fishing opportunities such as saltwater angling for sockeye salmon at the head of Redoubt Bay. Similar to the increasing trend in escapement estimates, subsistence harvest increased from an average of 150 (1982–1988) to 3,200 fish (1989–1999), and sport harvests increased from an average of 600 fish (1977–1987) to 2,450 (1988–1999). The 1999

**Table 17.—Sockeye salmon escapement (weir counts) and reported subsistence harvest (from permits) at Redoubt Lake, and estimated sport harvest for the Sitka area (SWHS estimates), 1982–2002.**

Year	Escapement	Subsistence harvest	Sport harvest
1982	442	99	628
1983	2,525	36	382
1984	11,545	175	635
1985	10,799	97	210
1986	9,588	96	366
1987	13,581	199	447
1988	3,590	334	3,147
1989	29,945	2,625	2,148
1990	72,781	5,346	1,344
1991	45,252	3,102	810
1992	10,266	96	434
1993	24,854	2,320	1,126
1994	39,449	4,120	2,138
1995	34,457	2,968	1,579
1996	18,931	3,297	3,041
1997	28,436	2,253	3,509
1998	51,185	4,262	3,781
1999	57,593	5,299	7,566
2000	2,498	35	2,382
2001	3,499	16	1,962
2002	23,943	1,197	n/a

sport harvest of sockeye salmon in the Sitka area (7,566) was the highest estimated by the SWHS for that fishery, and the 1998 and 1999 subsistence harvests (4,262 and 5,299) of sockeye salmon at Redoubt Lake were second only to the subsistence harvest estimated for 1990. In 2000 and 2001, escapements were the lowest since 1984, with 2,948 and 3,499 sockeye returning.

Low counts of sockeye salmon returning prompted closures of the sport and subsistence fisheries early in the season in 2000 and 2001. In 2002 for the subsistence fishery, the estimated effort was 362 hours and the harvest was 820 sockeye salmon. For the sport fishery, 73 hours were expended to harvest 0 sockeye salmon in the

subsistence fishing area. In marine waters adjacent to the outlet of Redoubt Lake, the sport fishery was observed during the course of the subsistence creel survey. In this area an estimated 175 hours of effort were expended to harvest 161 sockeye salmon.

### *Silver Bay and Salmon Lake Coho and Sockeye Salmon Management*

Increasing fishing effort on sockeye and coho salmon in Silver Bay and Salmon Lake has led to the development and implementation of a program to assess and better manage these fisheries. This program was initiated as a response to information that indicated a decline in abundance of coho salmon in Salmon Lake. From 1984 to 1990, annual spawning escapement counts of coho salmon in Salmon Lake declined steadily from 1,500 to 200 fish, and exploitation of the stock in commercial and sport fisheries increased from 36% to 74% (Schmidt 1996). Since 1990, fishing effort has continued to increase in the commercial purse seine and sport fisheries, but annual spawning escapement was not estimated until 2001. A CWT study completed in 1995 indicated that the exploitation of Salmon Lake coho salmon was high, and the resulting escapement was likely low.

Beginning in 1998, ADF&G and NSRAA initiated a cooperative effort to conduct snorkel surveys of the main inlet streams of Salmon Lake during October to assess the potential for survey counts to indicate trends in escapement. Peak survey counts in 1998 through 2002 resulted in coho counts of were 132, 107, 83, and 61 large adults, respectively.

At its February 2000 meeting, the Board of Fisheries acted on a number of proposals that indirectly impact coho salmon returning to Salmon Lake. At the meeting, members of the public, staff, and Board also voiced concern over the status of this stock. In response, the Board directed ADF&G to work closely with NSRAA and other stakeholders to develop a stock assessment program for Salmon Lake coho. The Board also directed ADF&G to conservatively manage fisheries that harvest Salmon Lake coho.

As a result of the Board's direction, a cooperative project between ADF&G, NSRAA, USFS, and the Sitka Tribe of Alaska (STA) and funded

with federal subsistence research monies was established to conduct research on both coho and sockeye salmon stocks in Salmon Lake. This cooperative project involves the estimation of sockeye and coho escapements as well as other biological variables including lake productivity, sockeye biomass, and coho presmolt abundance. To achieve the goal of estimating these statistics, a weir and field camp was built at the outlet of Salmon Lake.

The cooperative project started in 2001 and was continued in 2002. In 2002 ADF&G and STA again installed the floating weir and field camp at Salmon Lake. Both ADF&G and STA staff manned the weir between June 1 and November 1, 2002. Through the 2002 field season, all immigrating fish were counted, and biological and limnological data were collected. NSRAA tagged Salmon Lake coho presmolt in October.

In 2002, staff counted 1,020 coho salmon and 947 sockeye salmon through the weir. Because the weir was found not be fish-tight at short high-water intervals, a series of mark-recapture experiments was conducted to estimate coho and sockeye escapements. The mark-recapture experiments yielded estimates of 1,051 sockeye (SE = 20) and 1,139 (SE = 39) coho. On October 19, 2002, a peak snorkel survey count of 61 adult coho salmon was observed in the inlet stream system. This observation suggests that the spawning escapement in prior years was probably not at extremely low levels. This peak coho count represents approximately 5.3% of the estimated total escapement, a relatively low index of escapement compared to other streams in the region (Jones and McPherson 1997).

During October 2002, NSRAA tagged and released 5,045 coho presmolt. Most of these fish will smolt during 2003. Recoveries from the commercial fishery and escapement sampling in 2004 will provide an estimate of presmolt abundance in 2002. In addition, adult harvest and presmolt survival will be estimated through the recoveries of these fish.

### *Nakwasina River Coho Salmon Stock Assessment*

The Nakwasina River drainage is one of the largest river systems on Baranof Island and one of six systems surveyed annually in the Sitka

Management Area for escapement of coho salmon. The Nakwasina River has been the subject of a coho salmon assessment project since 1998 that supplements foot surveys conducted since 1988. Between 1998 and 2002, peak counts have ranged from 104 (1988) to 753 (2001) coho salmon. Average survey counts in the Nakwasina River represent the second largest for streams surveyed in the Sitka area.

The Nakwasina River is important to area sport fisheries because it supports a significant population of coho salmon, is easily accessed from Sitka, and is one of the few rivers in Sitka Sound that attracts freshwater sport fishing effort for coho salmon. From 1984 to 2001, estimated angler effort expended in Nakwasina Sound and River ranged from 31 to 891 angler days. In the 1960s, the majority of the anadromous portion of the Nakwasina River valley, including riparian zones, was clearcut (G. Killinger, Sitka Ranger District, U.S. Forest Service, Sitka, personal communication). Nakwasina River coho salmon are of special concern because of the potential risk of excessive exploitation in combination with likely impacts to the stock from habitat damage.

In 1998, Division staff began a CWT project for coho salmon in the Nakwasina River to estimate the smolt abundance and the harvest of this stock in commercial and sport fisheries. This ongoing investigation will be used to assess whether current regulations ensure sustained yield of this stock and provide for optimum sport fishing opportunity.

From April 15 through May 17, 2002 baited minnow traps were fished in the lower Nakwasina River, and 10,390 coho salmon smolt  $\geq 70$  mm FL were marked with an adipose finclip and given a CWT. Nine overnight mortalities occurred, and tag retention in sampled fish was 100% after 24 hours. In 2001 and 2002, fish  $< 85$  mm FL were given a tag code different than the one used for fish 85-mm FL or greater. In addition, fish present in Bridge Creek, a tributary that flows into the Nakwasina at high tide, were captured and tagged with a unique (third) tag code. This location was included for the first time in 2000 to boost sample size, and subsequently produced approximately one-third of all

smolt tagged. Smolt data collected in 2002 will be reported along with adult harvest and recovery data collected in 2003 in a 2004 FDS report.

In 2002, 48 adult coho salmon bearing CWTs from the Nakwasina River were recovered in random sampling of marine fisheries. The resulting harvest estimate for fish originating from the Nakwasina River is 731 (SE = 109). From September 5 to December 3, 2002, 869 individual coho salmon were captured, examined for tags, and marked in the Nakwasina River. Based on an open population experiment, we estimate that 3,371 fish escaped into the river. Results will be presented in detail in a Division of Sport Fish Fishery Data Series (FDS) report in 2003.

### *Baranof Lake Research*

Baranof Lake is relatively unique among large lakes in Southeast Alaska in that it supports only one species of fish, cutthroat trout. Physical and biological data were first collected from Baranof Lake in 1981 (Schmidt 1982). The average length of cutthroat trout in the 1981 sample (primarily sport caught) was 350-mm FL, but fish up to 500-mm FL were collected, indicating the potential for a high-quality sport fishery. Baranof Lake is now a moderately popular recreation area. In a mail survey that censused parties reserving USFS cabins on 13 cutthroat lakes throughout Southeast Alaska during 1992, Jones (1994) estimated that 528 (8%) of the total 6,338 hours fished and 113 (7%) of 1,573 total angler-days were expended at Baranof Lake. During 2002, USFS cabin users fished 95 hours to catch 95 cutthroat trout while harvesting 18. These estimates only reflect effort exerted by USFS cabin users; the fishing pressure at Baranof Lake was probably greater due to expansion of tourism at Baranof Warm Springs (A. Schmidt, Alaska Department of Fish and Game, Sitka, personal communication).

A research project at Baranof Lake is underway to estimate maximum sustained yield (MSY) of cutthroat trout. This MSY project is taking place at lakes having relatively high (Baranof Lake) and low (Turner Lake) densities of cutthroat trout. We believe that most of the lakes in

Southeast Alaska will fall somewhere within the spectrum of these high- and low-production examples.

Data collection and subsequent analysis to estimate MSY and natural survival (and mortality) rates at Baranof Lake will be completed as part of this research plan. MSY estimates will be based on sampling events separated by 4 years, the period during which recruitment from a parent brood to sampling gear is largely complete. Since multiple (perhaps 3) estimates of MSY for each system are probably needed to insure robustness of the relationships, the experiment at Baranof Lake will extend through the year 2003. Other benefits of the sampling include direct estimates of the natural survival rate, among the first for cutthroat trout in Alaska.

During May and June 1994, an inseason mark-recapture abundance experiment was conducted at Baranof Lake (DerHovanisian and Marshall

1995). The abundance of cutthroat trout  $\geq 180$ -mm FL was estimated at 12,186 (SE = 888) for a density of approximately 38 fish per hectare. This density ranked Baranof Lake foremost among carefully studied large lakes (Florence, Wilson, Hasselborg, and Turner Lakes) in Southeast Alaska. Subsequent Jolly-Seber abundance estimates for the years 1995 to 2001 averaged 6,752 and ranged from 5,582 to 7,794 cutthroat trout  $\geq 180$ -mm FL (Table 18).

Although two 10-day sampling trips were planned for 2002, lake ice prevented sampling in May. One 10-day sample trip to Baranof Lake was conducted between July 25 and August 3, 2002; 578 cutthroat trout  $\geq 180$ -mm FL were captured, tagged (or previous tags recorded), and released. Approximately 28% of the fish captured had been marked during previous years. Because only one sampling trip was conducted, we are unable to estimate cutthroat trout abundance in 2002.

**Table 18.—Estimated abundance and survival of cutthroat trout  $\geq 180$  mm FL and angler effort (number of anglers and angler-days fished), harvest and total catch of cutthroat trout at Baranof Lake, 1990–2001.** Fishing effort, harvest, and catch statistics are from the SWHS.

Year	Abundance <sup>a</sup>	SE	Survival rate	SE	Number of anglers	Angler-days fished	Harvest	Catch
1990					426	617	426	1,413
1991					319	497	392	654
1992					399	608	422	1,952
1993					362	842	841	2,943
1994	12,186	888	0.42	0.03	321	693	361	4,304
1995	7,224	533	0.58	0.05	451	1,109	218	1,940
1996	7,050	612	0.52	0.05	234	364	144	2,192
1997	5,582	487	0.61	0.06	671	1,111	337	2,910
1998	7,794	759	0.46	0.04	513	702	223	2,888
1999	6,961	652			320	498	95	1,020
2000	5,812	537			369	750	159	1,476
2001	6,840	869			321	683	168	773

<sup>a</sup> Petersen estimate for 1994, Jolly-Seber estimates for 1995–2000, preliminary Petersen estimate for 2001 (i.e., not all abundance assumptions have been statistically tested).

## *Swan Lake*

Swan Lake, located in downtown Sitka, is the site of an annual Junior Trout Derby for young anglers. Each year, Sport Fish Division supplements the rainbow trout population in Swan Lake with subcatchable rainbow trout from Sukoi Lake, Kruzof Island. The purpose of this program is to improve angler success by increasing the availability of rainbow trout. The project objectives are to produce 200 angler-days of fishing effort and to provide for a harvest of 150 rainbow trout each year.

On May 17 and 18, 2002, five hoop traps were baited with salmon eggs and set along the Sukoi Lake perimeter in 2.5 to 6 ft of water. Traps were checked and rebaited at least once during the 2-day period. Hook and line gear was also used (4 hours effort) both days to supplement hoop trap catches. A total of 213 rainbow trout were captured in hoop traps and an additional 27 caught by hook and line. We retained 204 rainbow trout for transport and marked them with an upper caudal clip. Trapping CPUE during the 2-day period averaged 27 rainbow trout per trap-day. Hook and line CPUE averaged 6.75 rainbow trout per angler-hour. On May 18, 2002, 201 rainbow trout were successfully transported from Sukoi Lake in an aerated tank via floatplane and stocked into Swan Lake.

The Junior Trout Derby was held on June 15, 2002. Anglers were provided buckets to hold fish alive for transport to the derby check station. Fish received at the derby were identified by species, measured to the nearest  $\frac{1}{8}$  inch, and examined for an upper caudal mark by USFS staff with the assistance of ADF&G staff. Most anglers chose to release their fish. Sixty-six cutthroat trout, 43 rainbow trout, and 12 Dolly Varden, for a total of 77 fish, were sampled at the derby station. Upper caudal clips were observed on 11 rainbow trout. Only 13 trout and one Dolly Varden over 11 inches were sampled.

## **Management Actions**

### *Sockeye Salmon Restrictions*

During the last seven years, sockeye salmon harvest increased at Falls Lake, Salmon Lake, Gut Bay Lake, and Hoktaheen Lake systems. At

Falls Lake, for example, annual subsistence harvests increased from an average of 160 (1985-1989) to 1,050 sockeye (1995-2002). Subsistence harvests at Salmon, Gut Bay, and Hoktaheen Lakes had followed similar trends and sport harvests, while small in comparison, are known to occur at these sites.

In response to increasing harvest trends, department staff restricted subsistence and sport fisheries each year beginning in 1999. In 2001, the Federal Subsistence Board closed the Falls Lake and Gut Bay drainages to non-Federally qualified users.

In 2001, federally funded sockeye stock assessment programs began at Falls and Salmon Lakes to provide information necessary to evaluate the stock status and current regulations. Information from these studies confirmed that sport harvests are small in comparison to the subsistence fisheries and subsistence harvests were increasing.

On June 25, 2002, sport bag and possession limits for sockeye salmon 16 inches or greater were decreased to 3 fish per day and 6 in possession in the Salmon Lake drainage on Baranof Island and the Hoktaheen Lake drainage on Yakobi Island and in saltwater areas within a 500-yard radius of the outlet streams to these systems and in the Gut Bay Lake and Falls Lake systems on Baranof Island (1-16-02EO).

### *Falls Lake Sockeye Salmon Sport Fishery Closure*

Sockeye salmon escapement at Falls Lake was monitored through a weir since June 17, 2002. The total escapement on June 20, 2002, was 25 sockeye salmon and, based on weir data (1981-1989), represented about 25 % of the expected escapement. Subsistence harvests reported on permit returns for Falls Lake sockeye have ranged from 17 to 1,270 since monitoring began in 1985. Observed subsistence fishing effort and harvest in 2002 was high. As a result, subsistence harvest of Falls Lake sockeye, if left unrestricted, was likely to far exceed historical reported levels and jeopardize the sustainability of the sockeye population. Sport fishing for sockeye also occurs in marine waters around the Falls Lake outlet and, based on estimates for the Sitka area and creel sampling in 2001, effort and

harvest is low relative to the subsistence fishery. However, because of the low projected escapement, a closure of the sport fishery was necessary to protect the Falls Lake sockeye population. Accordingly, all marine waters west of a line between the commercial fishery regulatory markers at the entrance of Falls Lake Bay and the Falls Lake drainage were closed by emergency order (1-27-02EO) to retention and possession of sockeye salmon by sport anglers from July 24 through December 31, 2002.

### *Salmon Lake Sockeye*

The total escapement of sockeye salmon at Salmon Lake, as of July 22, 2002, was 259 sockeye salmon. Based on 2001 weir data, this represented about 45% of the expected escapement. Subsistence harvests reported on permit returns for Salmon Lake had ranged from 0 to 353 since monitoring began in 1985. Observed subsistence fishing effort and harvest in 2002 was high. As a result, subsistence harvest of Salmon Lake sockeye, if left unrestricted, would have likely exceeded historical reported levels of harvest and jeopardized the sustainability of the sockeye population. Sport fishing for sockeye also occurs at Silver Bay and Salmon Lake drainage but, based on estimates for the Sitka area, effort and harvest is low relative to the subsistence fishery. However, because of the low projected escapement, a closure of the sockeye sport fishery was necessary to protect the Salmon Lake sockeye population. Accordingly, on July 24, 2002, all marine waters of Silver Bay south of 56° 59' 13" North Latitude and all fresh waters of the Salmon Lake drainage were closed by emergency order (1-26-02ED) to retention and possession of sockeye salmon by sport anglers from July 24 through December 31, 2002. Action was also taken to close the subsistence fishery at the head of Silver Bay.

### *Klag Bay Sockeye*

As of July 22, 2002, only 15 sockeye salmon had entered Klag Bay Lake. Based on reported harvest timing and weir data, this represented about 15% to 50% of the expected escapement. Subsistence harvests reported on permit returns for Klag Bay had ranged from 23 to 3,381 since monitoring began in 1985. Observed subsistence

fishing effort and harvest in 2002 was high. As a result, subsistence harvest at Klag Bay, if left unrestricted, would exceed historical reported levels of harvest and jeopardize the sustainability of this sockeye population. Sport fishing for sockeye occurs at Klag Bay but, based on estimates for the Sitka area, effort and harvest is low relative to the subsistence fishery. However, because of the low projected escapement, a closure of the sport fishery was necessary to protect the Klag Bay Lake sockeye population. On July 24, 2002, Klag Bay north of 57° 37' 38.9" N latitude and the Klag Bay Lake drainage were closed by emergency order (1-25-02EO) to retention and possession of sockeye salmon by sport anglers from July 24 through December 31, 2002. Action was also taken to close the subsistence fishery at Klag Bay.

### *Chinook Salmon Terminal Harvest Area Management*

Based on projections by NSRAA, surplus hatchery chinook salmon were expected to return to the Hidden Falls terminal harvest area and Medveje (Bear Cove) special harvest area in 2002. Early cost recovery harvests of chinook at both locations indicated that brood stock and cost recovery goals would be met in 2002. The Alaska Board of Fisheries, under 5 AAC 75.005, authorized the department to increase bag and possession limits and liberalize methods and means, by emergency order, when hatchery-produced fish escape through existing fisheries to designated harvest areas in numbers that exceed brood stock or cost recovery goals. In response to the surplus projection, the sport bag and possession limits in the Hidden Falls terminal harvest area and the waters of Silver Bay east a line from Entry Point to Silver Bay, were increased to 4 chinook salmon, of which no more than 2 could be 28 inches or more in length from June 21 through July 31, 2002 (1-15-02EO).

### *Swan Lake's Junior Trout Derby Regulations*

The Alaska Board of Fisheries adopted the cutthroat trout management plan that established specific criteria to provide harvest opportunities for trout in fresh waters near Southeast Alaska communities. Under the plan, the department may open, by emergency order, a season and



designate one fresh water near a community to allow the use of bait, eliminate the minimum size limit for trout, and establish a bag and possession limit of two fish if that community does not have nearby fresh waters where anglers can fish for trout with bait throughout the year. Sitka fits this definition. The plan also requires that the fresh water must be close to a community, have good road, trail, or boat access to the fresh water, and be landlocked or otherwise inaccessible to sea-run trout. Swan Lake meets those criteria. Since 1985, the Department has annually stocked up to 300 rainbow trout in Swan Lake to provide additional freshwater fishing opportunity in Sitka. The Sitka Rotary Club conducts an annual Junior Trout Derby to introduce young anglers to sport fishing. On June 15, 2002 the regulatory prohibition of bait and minimum size limits were rescinded by emergency order (1-13-02EO) during the derby to allow young anglers to catch the stocked fish.

#### *Redoubt Lake Sockeye Salmon Closure*

Redoubt Lake sockeye escapements in 2000 and 2001 represented 12% and 15% of average annual escapements from 1982 to 1999 and were the third and fifth lowest on record. In response, sport and subsistence fisheries targeting sockeye salmon in Redoubt Lake and Bay were closed by emergency order during both years. In the Redoubt Lake watershed, federal and state-managed fisheries were closed jointly by ADF&G and federal agencies, also during both years. There was no indication that the recent trend in low returns would reverse in 2002. Therefore, a closure of the sport fishery was thought to be necessary to achieve desired escapement levels. On June 21, 2002, all saltwater areas within Redoubt Bay east of the longitude of Road Island and all freshwater drainages flowing into that portion of Redoubt Bay were closed to retention of sockeye salmon by sport anglers from June 21 through December 31, 2002 (1-14-02EO).

On July 16, 2002, the total return counted at the Redoubt Lake weir was 6,872. Usually 26% or the run has returned to the lake by this date. The projected escapement for 2002 of 26,745 fish was above the average escapement of 21,841 sockeye during the period 1982–2001. Since the

projected escapement was within acceptable levels for this system, the closure was rescinded by emergency order (1-22-02EO) and sport bag limits for sockeye salmon of 3 fish per day and 6 in possession were implemented in all salt waters within Redoubt Bay and all freshwater drainages flowing into Redoubt Bay east of the longitude of Road Island.

On July 26, 2002, the total return counted at the Redoubt Lake weir was 14,739. Usually 50% of the run has returned to the lake by this date. The projected escapement of 30,921 fish was well above the normal average escapement. Since the projected escapement was above an acceptable level, the normal sockeye limits of 6 per day 12 in possession were implemented by emergency order (1-8-02EO) in all salt waters within Redoubt Bay and all freshwater drainages flowing into Redoubt Bay east of the longitude of Road Island.

#### *Freshwater Chinook Salmon Fishery Allowed in Sawmill and Salmon Lake Creeks*

Observations of chinook salmon in Sawmill Creek and Salmon Lake Creeks on August 19, indicated that hatchery king salmon had strayed from their production areas to local rivers. These king salmon exceed hatchery requirements. Regulations changing bag and possession limits were justified according to provisions in 5AAC 47.055 (k) (1) and 5AAC 75.003 (2) (b) to allow harvest of surplus king salmon by sport anglers. Bag and possession limits in the waters of Sawmill and Salmon Lake creeks were established at 10 king salmon of any size (1-31-02EO).

#### *Silver Bay and Salmon Lake Coho Salmon Management*

From 1984 to 1990, annual weir counts of coho salmon at Salmon Lake declined steadily from 1,500 to 200 fish, and exploitation of the stock in commercial and sport fisheries increased from 36% to 74%. Since 1990, fishing effort continued to increase in the commercial and sport fisheries that harvest Salmon Lake coho salmon. From 1997 through 2001, sport fishing bag and possession limit reductions and area closures were implemented to protect Salmon Lake coho and similar restrictions were implemented in

commercial fisheries. Foot survey counts conducted from 1997 through 2000 indicated sustained escapements to Salmon Lake. A weir and mark-recapture program implemented in 2001 provided the first estimate (1,424) of coho salmon escapement in Salmon Lake since 1990. This project also revealed that the weir undercounted the number of fish that migrated into the lake by approximately 30%, and provided the first strong indication that this run was sustainable while restrictions in sport and commercial fisheries were in place.

From July 28 to September 18, 2002, 228 coho salmon were counted through the weir. Past coho salmon weir counts at Salmon Lake had averaged 35% complete by this date. Based on weir counts, the 2002 escapement was projected to be less than half the escapement estimated in 2001. Because past management actions contributed to a sustainable population and results from the 2001 project cast uncertainty with the quality of past (1984–1990) escapement counts, a reduction in the bag and possession limit to 1 coho per day, 2 in possession, in Silver Bay and the Salmon Lake drainage was implemented to ensure the Salmon Lake coho population remained viable (1-34-02EO).

#### *Coho Salmon Restrictions for Bear Cove*

Because of low ocean survival, coho returning to Medvejie Hatchery were not expected to meet brood stock needs. In 2002, ocean survival of coho salmon returning to Medvejie Hatchery was estimated at 2.5%. This was less than a third of the average (1990 to 2001) of 10.7%. In 1993, 1994, and 2001, when ocean survival was at or below 8.8%, brood stocks needs were not met. As of September 17, 2001, no coho salmon had been observed at the hatchery raceway. On September 20, 2002 all waters east of a line between ADF&G regulatory markers on the north and south shores of Bear Cove were closed to retention of coho to ensure coho salmon brood stock needs could be achieved (1-33-02EO).

#### **Surveys**

Sitka area streams are surveyed annually to count steelhead and coho salmon. Peak counts are used as indices of spawning escapement to depict

long-term trends in spawning abundance. In addition, razor clam abundance is monitored at a local beach.

#### *Steelhead*

Since 1973, stream surveys have been conducted to count spawning steelhead in Sitkoh Creek, and, beginning in 1993, Ford Arm Creek as well (Table 19). Visual surveys conducted by foot were replaced with snorkel surveys in 1996 (Sitkoh Creek) and 1997 (Ford Arm Creek) because snorkel surveys were found to observe a higher proportion of steelhead populations (Johnson and Jones 1998). Observers attempt to conduct surveys once per week for three consecutive weeks during May to ensure a count during the peak inriver abundance. In 2002, the steelhead surveys were limited due to high water. Therefore peak counts were not identified.

Two surveys were conducted in Sitkoh Creek May 4 and May 20, 2002. The higher count, 65 steelhead, occurred May 20. This was the lowest count since 1996, when snorkel surveys were initiated. Visibility during both surveys was poor due to high water conditions. While results suggest spawning abundance in 2002 was below the average observed from 1996 to 2001, surveys conducted during 2002 may not be comparable to past surveys, due to poor snorkeling conditions and the timing of the surveys may not have occurred during the peak inriver abundance (Table 19).

Three surveys were conducted in Ford Arm Creek May 7, May 13, and May 22, 2002. The number of steelhead counted increased on each survey, with a last and highest count of 122 steelhead on May 22, 2002. This was the third highest count since the inception of snorkel surveys in 1997. Because of the increasing trend in the counts, the peak was not identified, but the count of 122 steelhead can be viewed as an indicator of an average to above-average run (Table 19).

#### *Coho Salmon*

Sport and Commercial Fisheries staff conduct annual foot, snorkel, and aerial surveys of streams in the Sitka area to count spawning escapements of coho salmon. Coho escapement counts were well above average for the six systems

surveyed (Table 20). The Black River count of 1,994 coho salmon is the highest count for this system since the helicopter survey was initiated in 1980. Observer visibility and survey conditions in 2002 were good for most surveys.

### *Razor Clam Monitoring*

Prior to 1994, Kruzof Island beaches supported the primary sport, personal use, and subsistence fisheries for razor clams in the Sitka area. Fisheries were concentrated at Kamenoi Beach in an area about 0.7 km long which is exposed to the ocean swell. From 1977 through 1986, trends in annual harvests of razor clams in the Sitka area were stable and averaged about 8,700 clams (Mills 1988). After 1986, annual harvests declined until 1993, when 1,000 only clams were taken (Mills 1994).

During spring 1993, numerous reports from the public indicated a substantial decrease in number of razor clams on Kamenoi Beach. Department surveys of the fishery during low tides in April and May documented low razor clam abundance. Potential causes of the decline are changes in tidal currents, beach composition and/or topography, increased predation by sea otters, overexploitation, and disease.

In response, the waters of Sitka Sound were closed to the taking of razor clams in 1993, and in 1994, Sport Fish Division initiated annual surveys to monitor abundance, size, and age compositions of razor clams on Kamenoi Beach. Each year during minus tides in May or June, two people dig for one hour throughout the known razor clam distribution. The number of clams dug is used as an index to identify long-term trends in abundance levels. All clams collected are measured for length and aged to identify successful reproduction and relative size and age composition.

One survey was conducted in 2002. On May 26, two people dug 26 clams in 1 hour, during a -3.2 tide with little swell or wind (Table 21). This is the second lowest index count since 1994. To ensure the potential for recovery of this razor clam population, sport, personal use, and subsistence fisheries remained closed to the taking of razor clams in 2002.

**Table 19.—Peak escapement counts of steelhead in the Sitka area, 1973–2002.**

Stream	Year	Survey type (no.)	Peak survey date	Peak count
Sitkoh Creek	1973	Foot (1)	04/27	33
	1976	Foot (1)	05/17	18
	1978	Foot (1)	05/16	17
	1980	Foot (1)	06/02	42
	1981	Foot (1)	06/03	42
	1982	Foot (2)	05/30	58
	1983	Foot (1)	05/17	143
	1984	Foot (1)	05/11	92
	1985	Foot (1)	05/21	115
	1986	Foot (1)	05/21	58
	1987	Foot (1)	05/20	107
	1988	Foot (1)	05/24	17
	1989	Foot (1)	05/18	20
	1991	Foot (1)	05/14	40
	1993	Foot (1)	05/14	23
	1994	Foot (1)	05/16	67
	1995	Foot (2)	05/09	81
	1996	Snorkel (2)	05/14	270
	1997	Snorkel (1)	05/20	329
	1998	Snorkel (2)	05/12	154
	1999	Snorkel (2)	05/19	120
Ford Arm Creek	2000	Snorkel (2)	05/04	112
	2001	Snorkel (2)	05/16	125
	2002	Snorkel (2)	05/20	65
	1993	Foot (3)	07/14	31
	1994	Foot (1)	05/17	67
	1995	Foot (3)	05/24	75
	1996	Foot (1)	05/16	125
	1997	Snorkel (2)	05/16	197
	1998	Snorkel (2)	05/11	103
	1999	Snorkel (3)	05/18	89
	2000	Snorkel (4)	05/26	134
	2001	Snorkel (1)	05/03	110
	2002	Snorkel (3)	05/22	122

**Table 20.—Peak escapement counts of coho salmon in the Sitka area by date, 1980–2002.** F = foot; S = snorkel; H = helicopter; ns = not surveyed.

Year	Sinitzin Creek		St. John Baptist Bay Creek		Starrigavan River		Eagle River		Nakwasina River		Black River	
	Peak survey date / type	Peak count	Peak survey date / type	Peak count	Peak survey date / type	Peak count	Peak survey date / type	Peak count	Peak survey date / type	Peak count	Peak survey date / type	Peak count
1980	30-Sep / F	39	9-Oct / F	26	ns <sup>b</sup> / F		ns		29-Oct / F	70	26-Oct / F	328
1981	6-Oct / F	85	14-Oct / F	51	20-Oct / F	170	22-Sep / F	27	7-Oct / F	780	ns	
1982	20-Oct / F	46	ns		21-Oct / F	317	ns		ns		ns	
1983	27-Sep / F	31	13-Oct / F	12	6-Oct / F	45	ns		14-Oct / F	217	ns	
1984	10-Oct / F	160	10-Oct / F	154	10-Oct / F	385	ns		10-Oct / F	715	3-Oct / H	425
1985	15-Oct / F	144	8-Oct / F	109	11-Oct / F	193	ns		7-Oct / F	408	7-Oct / H	1,628
1986	30-Sep / F	4	10-Oct / F	9	10-Oct / F	57	26-Sep / F	245	28-Oct / F	275	10-Oct / H	312
1987	23-Sep / F	32	23-Sep / F	9	9-Oct / F	36	24-Sep / F	167	30-Oct / F	47	9-Oct / H	262
1988	3-Oct / F	56	3-Oct / F	71	12-Oct / F	45	2-Sep / F	10	27-Oct / F	104	10-Oct / H	280
1989	5-Oct / F	76	5-Oct / F	89	13-Oct / F	101	2-Oct / F	130	19-Oct / F	129	13-Oct / H	181
1990	1-Oct / F	80	1-Oct / F	35	17-Oct / F	39	2-Oct / S	214	31-Oct / F	195	4-Oct / H	842
1991	1-Oct / F	186	10-Oct / F	107	2-Oct / F	142	17-Oct / S	454	25-Oct / F	621	17-Oct / H	690
1992	23-Sep / F	265	14-Oct / F	110	12-Oct / F	241	6-Oct / S	629	30-Oct / F	654	6-Oct / H	866
1993	7-Oct / F	213	6-Oct / F	90	13-Oct / F	256	13-Oct / S	513	ns		7-Oct / H	764
1994	30-Sep / F	313	30-Sep / F	227	11-Oct / F	304	1-Oct / S	717	14-Oct / F	404	14-Oct / H	758
1995	26-Sep / F	152	5-Oct / F	99	6-Oct / F	272	5-Oct / S	336	29-Sep / F	626	27-Sep / H	1,265
1996	2-Oct / F	150	2-Oct / S	201	17-Oct / F	59	30-Sep / S	488	30-Oct / F	553	30-Sep / H	385
1997	29-Sep / F	90	30-Sep / S	68	27-Oct / F	55	30-Sep / S	296	14-Nov / F	239	30-Sep / H	686
1998	1-Oct / F	109	9-Oct / S	57	8-Oct / F	123	9-Oct / S	300	2-Nov / F	653	8-Oct / H	1,520
1999	11-Oct / S	48	29-Oct / S	25	8-Oct / S	166	ns		12-Nov / S	291	4-Oct / H	1,590
2000	26-Sep / F	62	26-Sep / S	32	8-Oct / S	144	29-Sep / S	108	8-Nov / F	419	2-Oct / H	880
2001	5-Oct / F	132	4-Oct / S	80	3-Oct / S	130	4-Oct / S	417	14-Nov / F	753	4-Oct / H	1,080
Mean (80–01)		112		79		156		316		408		776
5-yr mean (97–01)		88		52		124		280		471		1,012
2002	10-Oct / F	169	2-Oct / S	100	11-Oct / S	227	10-Oct / S	659	5-Nov / F	713	3-Oct / H	1,994

**Table 21.—Razor clam indices for Kamenoi Beach, 1994–2002.**

Year	Age									Total
	1	2	3	4	5	6	7	8	9	
1994	56	44	24	13	10	7	3	1		158
1995	22	43	38	10	9	2	7			131
1996	8	20	30	36	6	4	1	2	1	108
1997	1	4	61	19	5	4				94
1998	5	16	10	39	5	1				77
1999		21	25	42	20	3				111
2000		2	9	13	8	1				33
2001	7	9	20	27	12	4		1		80
2002	4	8	8	5		1				26

### **Federal Subsistence Management**

In 2001 the Federal Subsistence Board closed the federally managed waters of the Redoubt Lake to non-federally qualified users and established a federal subsistence sockeye fishery with a daily limit of 10 sockeye and an annual limit of 50. A federal subsistence permit program with reporting requirement was also established, and first implemented in 2002. On July 25, 2002 the FSB rescinded the closure of all Redoubt Lake fresh waters to non-federally qualified users when weir counts indicated that sockeye escapement would be above average. This action also rescinded the requirement for a federal subsistence permit.

In 2002, the FSB deliberated a proposal by the Sitka Tribe of Alaska to modify the Redoubt federal subsistence sockeye fishery and extend the fishery into marine waters. The Southeast RAC supported the proposal. Both the department and federal staff opposed these proposals for the following reasons: the FSB does not have jurisdiction over marine waters identified in the proposals; closing these areas to non-federally qualified users would unnecessarily restrict non-federal fisheries because there are no conservation problems, and divergence between state and federal programs would increase public confusion and impact the ability to monitor harvest. Additional concerns of the department were the incidental harvests of non-targeted species with a proposed year-round federal subsistence season, harvest limits that would allow overfishing, and an unclear identification of subsistence needs. The

FSB deferred action on harvest limits, methods, and means, pending action by the Alaska BOF on the Redoubt Sockeye Management Plan. The portions of the proposal that extended federal jurisdiction in Redoubt Bay and closed the Redoubt area waters to non-federally qualified users were rejected.

### **Access Projects**

Discussions continued between ADF&G and State Parks Staff concerning expansion of the existing parking lot to provide 14 additional parking spaces for vehicles with trailers at the Starrigavan boat launch facility. Currently, vehicles without trailers park in spaces designated for vehicles with trailers, rendering the spaces for trailers unusable. During weekends in summer, parking space is fully utilized and overflow must use more distant parking areas.

Providing a boat launch facility at Herring Cove in Silver Bay, including boat ramp, float, parking and picnicking areas, was also discussed with the City Parks and Recreation Department. In 2000, the City submitted a funding request for such a facility. In 2001, ADF&G allocated \$150,000 to conduct a feasibility study for the site. In 2002, the Herring Cove site was surveyed and three configurations for the boat ramp facility were developed. In 2002, two public meetings were held regarding the proposed Herring Cove facility, and the feasibility study was started. Conceptual drawings of the Herring Cove Boat Launch were presented for public comment at the second meeting.

## **JUNEAU/GLACIER BAY AREA**

The Juneau management area includes all marine and fresh waters in the vicinity of Admiralty Island, Douglas Island, Northern Chichagof Island, Lynn Canal, and the immediate Juneau area (Figure 13). Included in this area is the Glacier Bay harvest area as reported in the Statewide Harvest Survey. The major Juneau area sport fisheries are in marine waters for chinook salmon, coho salmon, Pacific halibut, and Dungeness crab, and in fresh water for coho salmon, cutthroat trout, Dolly Varden, and steelhead. Popular personal use fisheries consist of sockeye fisheries in the Taku River and at Sweetheart Creek, and a red king crab fishery that occurs in much of northern Southeast Alaska but with high levels of fishing effort around Juneau in Subdistrict 11-A. Sport Fish area management staff for the Juneau area consists of one permanent Fishery Biologist III, Brian Glynn, and a Fishery Biologist II assistant, Jason Shull.

### **Local Management and Research Programs**

A variety of research and stock assessment programs were conducted in the Juneau management area by divisional and other departmental staff in 2002. Almost all are ongoing programs designed to track the status of fish stocks and fisheries in order to adequately manage them for sustained yield and to meet quota and allocation requirements as established by the Alaska Board of Fisheries.

The Division of Sport Fish conducted full stock assessment programs on the Taku River in 2002 for both chinook and coho salmon. The programs consisted of coded wire tagging (CWT) studies to estimate smolt production, smolt survival, and fishery contribution. Returning adult chinook and coho salmon were captured by gillnet and/or by a fish wheel at Canyon Island, and then tagged with spaghetti tags, and finally recovered in Canadian fisheries or during spawning ground surveys.

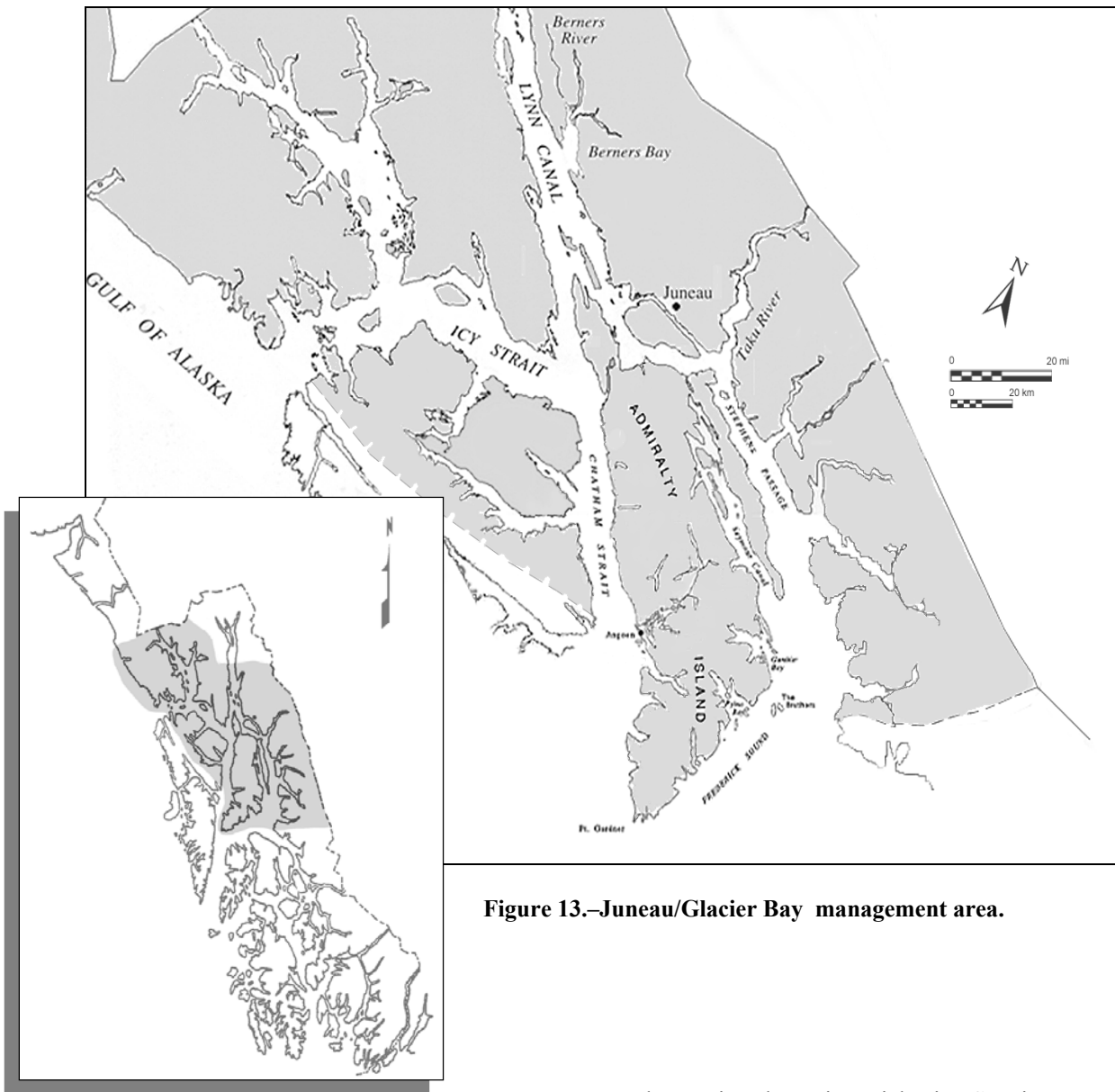
The Division of Commercial Fisheries conducted a similar coho salmon stock assessment program at the Berners River north of Juneau, and also conducted king crab stock assessment surveys in surrounding marine waters, with special empha-

sis in Subdistrict 11-A, where the Board of Fisheries has allocated harvest of red king crab between the commercial (40%) and personal use (60%) fisheries.

In spring 2001, the Assistant Area Management Biologist installed a smolt weir in Jordan Creek below Yandukin Blvd. on airport property. A surprisingly large number of coho salmon smolts (>26,000) were found emigrating from Jordan Creek despite very poor parent year escapements. In 2002, this investigation was continued with a fully funded project to coded-wire-tag all coho salmon emigrating from the creek during the spring migration. Work in Jordan Creek also included counting and sampling Dolly Varden for length; and counting, sampling and tagging with passive integrated transmitters (PIT) all cutthroat emigrating from the system. The weir that was used to count and sample fish in Jordan Creek was operated from April 21 through June 28. During that time period, 8,312 coho salmon were counted. Of that number, 7,860 were tagged with CWTs.

Identical work was conducted in Duck Creek through the use of a weir located in the upstream end of the culvert at the entrance to the Mendenhall Mall access road and operated from May 22 through June 17. During that period, 489 coho salmon smolt were counted and 332 were tagged with CWTs. Similar activities were also conducted at Switzer Creek, however work there did not include capturing and counting all fish emigrating from the system, but consisted only a sampling of fish migrating during the period May 16 through June 18. During that period, coho smolt were captured and tagged with CWTs.

The primary purpose of the Jordan, Duck, and Switzer projects was to examine the production of anadromous fish in these streams, evaluate the health of Duck Creek with regard to past and future stream restoration efforts, and to determine if small streams that flow into the Mendenhall wetlands interact with each other as rearing sites for coho salmon. Information gathered on Jordan Creek has special importance since, in 1998, the creek's poor water quality (deposits of silt and debris, and low dissolved oxygen) caused it to be listed as a "Tier 1" impaired water body under Section 303(d) of the Clean Water Act. Prior to 2002, index survey counts of coho salmon escapement in Jordan Creek averaged only 58 fish,



**Figure 13.—Juneau/Glacier Bay management area.**

compared to an average 337 fish during the seven prior years (1988–1994). In addition, recommendations opposing restoration of fish habitat in Jordan Creek and in favor of relocating the creek away from the airport property have been suggested in a wildlife hazard assessment contracted by the Juneau International Airport as a result of past aircraft bird strikes (Wilmoth et al. 2001). Additional culverting of the creek on airport property could also occur if a proposal to widen and extend the runway and taxiway is adopted.

The National Marine Fisheries Service personnel and departmental staff worked cooperatively at the Auke Creek weir in conducting the annual stock assessment program on the fishes of Auke Creek and Auke Lake. Results of the Auke Creek investigations are summarized in an annual report prepared by the weir staff (Lum and Taylor, unpublished). Counts of outmigrating fish (spring counts) were generally below average for 2002 (Table 22). Counts of returning adults (fall counts) were well below average for pink and sockeye salmon, well above average for coho salmon, and about average for Dolly Varden and cutthroat trout (Table 22).

**Table 22.—Spring and fall counts of anadromous salmon and sea run cutthroat trout and Dolly Varden at Auke Creek, 2002.**

	Pink salmon fry	Coho salmon smolt	Sockeye salmon smolt	Chum salmon fry	Dolly Varden	Cutthroat trout	
2002	150,149	3,186	17,987	2,003	4,584	172	
Mean (1980–2002)	106,892	6,310	16,913	5,197	6,347	261	
Fall weir counts							
	Pink salmon	Coho salmon	Sockeye salmon	Chum salmon	Chinook salmon	Dolly Varden	Cutthroat trout
2002	4,928	1,176	2,882	1,587	688	4,341	241
Mean (1980–2002)	10,265	722	5,202	792	248	4,610	268

Trout and char research projects were also conducted in the Juneau management area. In addition to studies of the anadromous runs at Auke Creek, a mark-recapture experiment found that there were approximately 350 resident cutthroat trout in the lake (Lum and Taylor, unpublished). An ongoing cutthroat trout project continued at Turner Lake. The goal of the project is to assess the effects of the trout catch-and-release regulation in place for that lake and also to determine what level of harvest of cutthroat trout is sustainable.

The Juneau marine creel survey program again provided important in-season harvest, effort, and stock composition information concerning the local marine boat sport fishery. Dockside interviews were conducted from late April to late September. This program has gone through many changes, but is likely the longest running onsite marine creel program in Alaska. Estimates of effort, harvest, catch, and contributions of wild and hatchery stocks all appear in an annual FDS report covering harvest studies of selected marine sport fisheries (Hubartt et al. *In prep.*).

## Management Actions

### *Chinook Salmon Terminal Harvest Area Management*

Emergency order 1-09-02EO, issued on June 5, 2002 and effective June 8, 2002, opened a terminal saltwater area around Juneau to liberalize harvest of surplus hatchery-produced chinook salmon. The bag and possession limit in

this saltwater area was four chinook salmon, any size. This regulation remained in effect through August 31, 2002. The terminal area included all contiguous marine waters east of a line from Indian Point, in Auke Bay, to the tip of False Outer Point on North Douglas Island, and waters west of the Juneau-Douglas Bridge. Chinook salmon taken in this terminal area by nonresidents did not count toward their annual limit of three king salmon, and there was no harvest-recording requirement.

A similar emergency order (1-12-02EO), issued approximately one week later on Thursday, June 13, opened all freshwater drainages crossed by the Juneau road system that were open to sport fishing to chinook salmon harvest. The limits in these freshwater areas was the same as in the saltwater terminal area: 4 chinook salmon daily and in possession, any size. This regulation remained in effect through September 30, 2002. Anglers were also permitted liberalized methods and means at Fish Creek Pond, including use of bait, retention of chinook salmon hooked elsewhere than in the mouth, and use of fixed or weighted hooks and lures and multiple hooks with a gap between the point and shank larger than ½ inch.

### *Saltwater Closure Adjacent to Auke Creek*

A small area of Auke Bay, immediately off the mouth of Auke Creek, was closed to all sport fishing from June 28 through September 13, 2002 (1-19-02EO). The affected area was inside of a line extending from the Auke Bay Laboratory's boat dock south to the nearest of two white buoys



marking the location of the laboratory's saltwater intake pipe, then continuing to an identical second buoy, and finally extending to a departmental regulatory marker on the Fritz Cove shoreline.

This action was necessary to protect adult sockeye salmon returning to the Auke Lake system. The projected escapement of sockeye salmon to Auke Lake in 2002 was approximately 2,000, far short of the escapement goal of 5,000 fish. In the past several years, anglers targeting hatchery king salmon that return to the area end up also catching sockeye salmon. Moreover, weir staff have documented that as many as 10% of the sockeye salmon seen at the Auke Creek weir have snagging injuries. The resulting escapement totaled 2,882 sockeye salmon.

### *Twin Lakes Stocking*

The department contracts with Douglas Island Pink and Chum, Inc. (DIPAC) to annually stock Twin Lakes with 10,000 catchable chinook or coho salmon. This stocking supports Family Fishing Day and sport fishing at the lake throughout the year. In 2002, DIPAC once again placed approximately half of the fish in Twin Lakes in April, to provide space for young-of-the-year fry in raceways. The remainder of the fish were stocked in late May, several weeks prior to Family Fishing Day. Shoreline areas were clear of milfoil, which in some prior years has restricted shoreline fishing.

### *Windfall Lake Sockeye Fishery*

By regulation, anglers are allowed to fish the Windfall Lake outlet area for sockeye salmon only on Wednesdays and Saturdays during the month of June, with the fishing area closed completely the remainder of the time during June and July. Windfall Lake and inlets are closed year-round to the retention of sockeye salmon by sport anglers. However, the final Wednesday opening (June 26) of the 2002 sockeye fishery at Windfall was interrupted because the Forest Service closed the access trail for maintenance purposes. Therefore on June 25, 2002, an Emergency Order (01-18-02EO) was issued to make up for the lost time by permitting anglers to fish Thursdays in June as well as Wednesdays and Saturdays. This action allowed anglers one additional day of fishing on Thursday June 27.

## **Escapement Surveys**

### *Coho Salmon*

Escapement of coho salmon to five streams along the Juneau road system was monitored by multiple foot surveys. The five streams provide an index of stock strength in the Juneau area and are also utilized to supplement abundance estimates of coho escapement on a regional level.

Coho escapements were substantially higher in 2002 than in 2001. However one stream, Peterson Creek was slightly below the point escapement goal, but within the escapement goal range. The escapements in the other four Juneau index streams ranged from 2.5 times to 9.3 times their respective escapement goals (Table 23). The index count of 1,396 spawners in Jordan Creek was the highest on record and grossly exceeded anyone's expectations.

### *Steelhead*

Peak counts of steelhead escapement in Peterson Creek on the Juneau road system and Pleasant Bay Creek in lower Seymour Canal were monitored in 2002 to provide an annual index of steelhead abundance. Because of the relatively low number of fish in a given steelhead population, these escapements are monitored through weekly "snorkel surveys," as opposed to the foot surveys used for monitoring coho escapements. In a snorkel survey, two observers count the number of steelhead seen while snorkeling along a given reach of stream.

Peterson Creek and Pleasant Bay Creek have been selected as the best indicator streams in the Juneau area, based primarily on the relatively short length of stream accessible to returning steelhead spawners. The barrier falls on each of these two streams limits the upstream migration of steelhead to a distance that can be surveyed in its entirety in only a few hours. Additionally, they are extremely popular among sport anglers, as Peterson is easily accessed from the Juneau road system, and Pleasant Bay provides a larger population of fish in a pristine setting.

Because snorkel surveys of Peterson and Pleasant Bay creeks have only been conducted since 1994 and 1996 respectively, we are still learning about variability in annual run strength and peak timing. Due to high stream flow conditions on Peterson

**Table 23.—Average peak counts of coho salmon during foot surveys of Juneau area index systems for 1981–2001 in comparison to 2002 peak counts and escapement goals.**

	Jordan Creek	Montana Creek	Peterson Creek	Steep Creek	Switzer Creek
1981–2001 average	270	992	263	266	87
2002 peak count	1,396	2,440	195	380	124
2002 % of average	930%	544%	98%	253%	248%
Point esc. goal	150	450	200	150	50
Esc. goal range	75–200	200–500	100–350	100–300	25–75
2002 at or above goal?	yes	yes	yes	yes	yes

Creek during 2002, only two surveys were conducted—one early in the run timing and one late. As such, it is likely the true “peak” count was not achieved. The peak count in 2002 was only 13 fish; half the prior low count of 26 steelhead observed in 1997. The average peak count for Peterson Creek is 29 steelhead.

A record low number of steelhead were also observed in Pleasant Bay Creek—only 36 in 2002, compared to the prior low count of 48 fish observed in each of the past two years’ surveys. The average peak count of steelhead observed in Pleasant Bay Creek is 83.

### *Sockeye Salmon*

The sockeye salmon stock that provides a fishery at the mouth of the Windfall Lake outlet stream was again monitored through an index survey of escapement in Slate Creek (an inlet to Windfall Lake). In 2002, 830 adult sockeye salmon were observed in the Slate Creek index area.

### **Access Projects**

In 2002, the Douglas Harbor Launch Ramp project was completed. This project was the Sport Fish Division’s contribution to the City’s Douglas Harbor expansion project. Improvements to the Amalga Harbor and the North Douglas launch ramps are still planned but will occur in the near future.

No shoreline access projects were undertaken in 2002; however, there is a tentative plan for trail improvements at Fish Creek on north Douglas Island.

### **Other Issues**

#### *Chinook Salmon Broodstock Development at Macaulay Hatchery*

The current fish genetics policy states that a particular stock of salmon cannot be used at more than three production-level hatcheries in the region. Macaulay Hatchery has been trying to change its chinook salmon stock from Andrew Creek because it is used at too many other hatcheries in Southeast Alaska. An alternative stock from King Salmon River was under development for some time, but for a variety of reasons, efforts to develop the King Salmon River brood stock were not successful. Rather than work toward an exemption from the genetic policy, hatchery and departmental personnel began to consider the Tahini River chinook salmon stock, which is being used in enhancement projects in the Haines and Skagway areas, as a potential replacement brood for the Juneau king salmon enhancement program.

The people of Skagway, DIPAC, and departmental staff cooperated to develop a plan to place Tahini River chinook salmon eggs taken from adult chinook salmon returning to Burro Creek and Pullen Creek near Skagway into Macaulay Hatchery for rearing and subsequent release as smolts back in the Skagway area. The first 100,000 chinook salmon alevins were transported to Juneau in December 1998 and held through 1999. About 91,000 smolts were transferred to and released at Pullen Creek in spring 2000.

Unfortunately, in 1999 only about 34,000 to 35,000 eggs were obtained, and approximately 32,000 smolts were raised, transported, and released at Skagway in spring 2001. Hatchery personnel were much more successful obtaining eggs from the return of adults in 2000, and 122,000 king salmon eggs were transported to Macaulay Hatchery for incubation and rearing, with a release date for the subsequent smolts of spring 2003.

The plan is to develop a return of chinook salmon to the Skagway area sufficient to provide enough eggs from the Tahini Stock for a complete replacement of the eggs needed to sustain the Juneau chinook program at DIPAC's Macaulay Hatchery

#### *Hatchery Chinook Salmon Terminal Escapements and Associated Issues*

In 2002, roughly 477,000 hatchery reared chinook salmon smolt were released in the Juneau area. Of that number, 213,000 were released from the Macaulay Hatchery, and 264,000 from two remote release sites; 179,000 from the mouth of Fish Creek and 85,000 from the mouth of Auke Creek.

The 2002 return of hatchery king salmon to the Juneau area was a record 10,370. This number includes fish caught in both the sport and commercial fisheries plus the number returning to the hatchery. Shoreline and marine boat sport fishing for hatchery chinook salmon occurs at each of the three release sites. In 2002, the large number of anglers attracted to the City's Statter Harbor docks and breakwater in Auke Bay resulted in the City harbormaster prohibiting all sport fishing within the harbor area. The justification for this action was stated as interference with boat traffic in the harbor, fish carcasses and guts being left on the docks, and the potential for hook injuries associated with snagging. This fishing prohibition appeared to be well within the authority of the harbormaster, as the City has management authority of all the floating docks as well as all submerged leased lands beneath the docks.

In January 2003, the Harbormaster sent a letter to the Juneau area management biologist stating that the Harbor Board had taken up the issue of fishing at Statter Harbor and decided to prohibit snagging on "select harbor property and floats" and that action had resolved the problems that were occurring within the harbor.

## **HAINES/SKAGWAY AREA**

The Haines/Skogway management area includes all waters from Point Sherman to the Canadian border, including Lynn Canal and all drainages entering it (Figure 14). The major fisheries in the area are in salt water for chinook salmon and Pacific halibut and in fresh water for cutthroat trout, Dolly Varden, coho, sockeye, and pink salmon. Two major drainages support substantial sport fisheries in the Haines area: the Chilkoot and Chilkat rivers. The Skogway area has limited fisheries resources and relies more on hatchery production to provide sport fishing opportunities. Permanent Sport Fish management staff consists of one Fishery Biologist III, Randolph Ericksen, stationed in Haines.

### **Local Management and Research Programs**

#### *Chinook Salmon*

The Chilkat River is considered the third or fourth largest producer of chinook salmon in Southeast Alaska (Pahlke 2001). A spring sport fishery in Chilkat Inlet near Haines targets mature chinook salmon returning to the Chilkat River. A creel survey has been used to estimate effort and chinook harvest in this fishery since 1984. Historically, this fishery harvested up to 1,700 chinook salmon annually (Table 24). From 1981 through 1992, the escapement was monitored through index counts on clearwater tributaries to the Chilkat River. Restrictive management of the fishery began in 1987 when high harvests of chinook salmon in the sport fishery coincided with low numbers of fish observed in spawning tributaries. The restrictions culminated with a closure of the spring fishery in 1991 and 1992.

Mark-recapture experiments have been used to estimate the abundance of large chinook salmon entering the Chilkat River since 1991. Inriver abundance of large chinook salmon has varied between 2,035 and 8,100 fish (Table 24). These studies showed that escapements were higher than expected and the fishery was reopened in 1993. Since then, the estimated harvest of chinook salmon in the spring fishery has averaged about 250 fish despite liberalized harvest regulations. It is unclear whether the high harvests observed during the mid 1980s were the result of higher

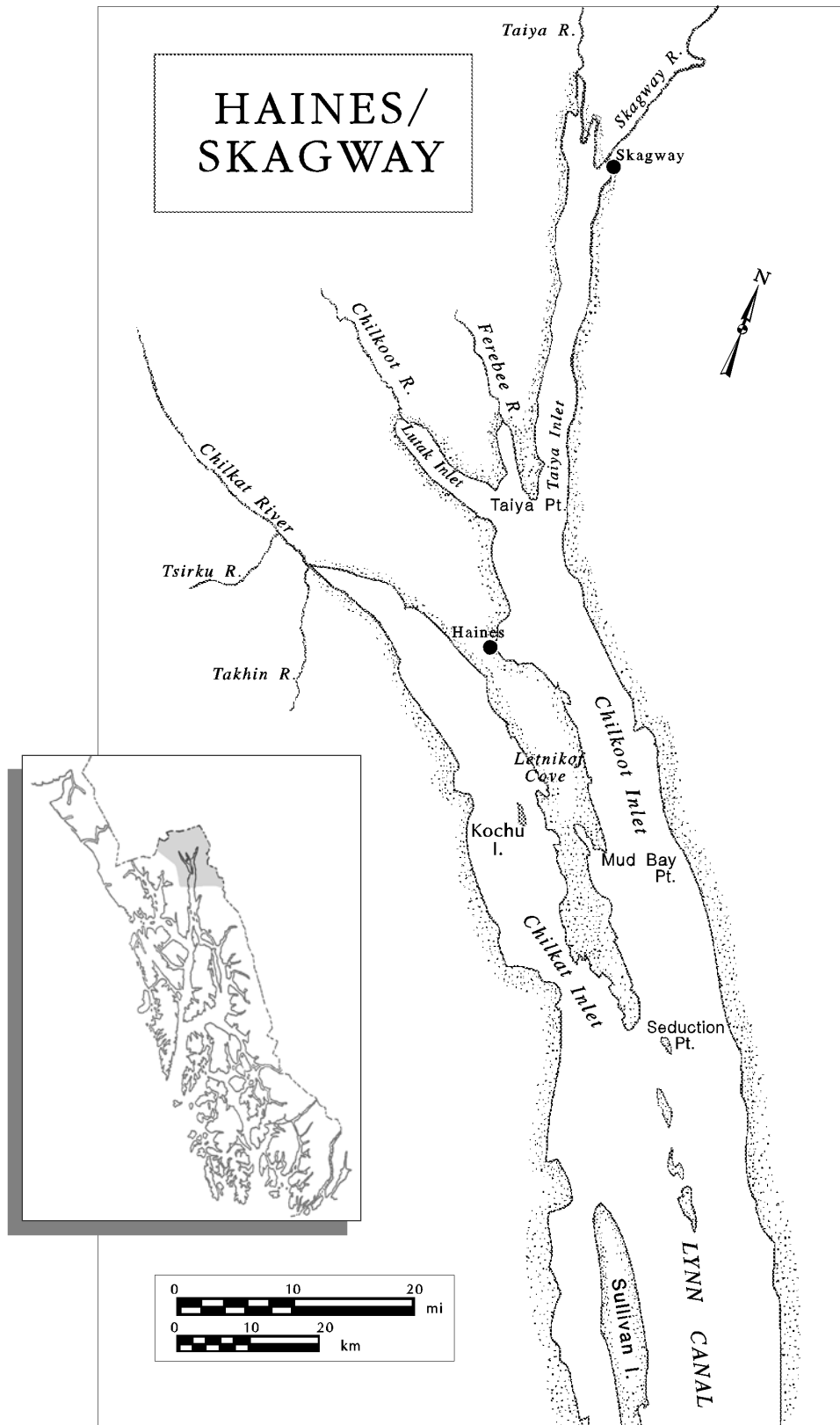


Figure 14.–Haines/Skagway management area.

**Table 24.—Estimated angler effort, catch and harvest of large ( $\geq 28$  in.) chinook salmon in the spring Haines marine boat sport fishery, 1984–2001, and abundance of large ( $\geq$  age 1.3) chinook salmon entering the Chilkat River, 1991–2002. [Data through 2001 from tables in Ericksen (2002); 2002 data from Ericksen (*In prep.*, a).]**

Year	Salmon hrs-effort	SE	Chinook salmon				CPUE <sup>a</sup>	Inriver abundance <sup>b</sup>	SE
			Catch	SE	Harvest	SE			
1984	9,855	c	1,072	c	1,072	c	0.109		
1985	20,582	c	1,705	c	1,696	c	0.083		
1986	32,533	c	1,659	c	1,638	c	0.051		
1987	22,848	2,191	1,094	189	1,094	189	0.048		
1988	32,723	3,476	505	103	481	101	0.015		
1989	9,363	922	237	42	235	42	0.025		
1990	11,972	1,169	248	60	241	57	0.021		
1991			Fishery closed					5,897	1,005
1992			Fishery closed					5,284	949
1993	9,069	1,479	349	63	314	55	0.038	4,472	851
1994	7,682	597	269	41	220	32	0.035	6,795	1,057
1995	8,606	483	255	42	228	41	0.030	3,790	805
1996	9,596	866	367	43	354	41	0.038	4,920	751
1997	8,758	697	381	46	381	46	0.044	8,100	1,193
1998	7,546	747	222	60	215	56	0.029	3,675	565
1999	6,097	734	184	24	184	20	0.030	2,271	408
2000	4,043	532	103	34	49	12	0.025	2,035	334
2001	5,107	508	199	26	185	26	0.039	4,517	722
2002	7,566	634	343	40	337	40	0.045	4,050	433
1984–1990 avg.	19,982		931		922		0.050		
1993–2002 avg.	7,407		267		247		0.035	4,463	
1984–2002 avg.	12,585		541		525		0.042	4,651	

<sup>a</sup> Catch of large ( $\geq 28$  inches) chinook salmon per salmon hour of effort.

<sup>b</sup> Abundance of large ( $\geq$  age 1.3) chinook salmon entering the Chilkat River. No estimates available prior to 1991.

<sup>c</sup> No variances available for 1984–1986.

effort, larger returns of chinook salmon to the Chilkat River, or both. The effort, catch, and harvest of Chilkat River chinook salmon in the Haines spring marine boat fishery dropped to its lowest level in 2000, corresponding with the lowest escapement on record. The Chilkat chinook salmon return improved in 2002, and effort and harvest in this fishery increased (Table 24).

Management of Chilkat River chinook salmon has been largely passive in recent years. For example, Chilkat Inlet, off the mouth of the river, is closed to sport fishing by regulation from April 15 to July 15. However, our goal is to take more active management in the future in order to more allow greater harvest in years of high abundance

and restrict harvest in years of low abundance. Beginning in 1998, we began forecasting the return of large chinook salmon to Lynn Canal based on the previous year's sibling return (e.g., the return of age 1.3 fish in 2001 is used to forecast the return of age 1.4 fish in 2002). The 2002 preseason run forecast (6,529, 80% CI = 4,632–8,426) was reasonably close to the postseason estimate (4,457, SE = 493).

The Upper Lynn Canal Fish and Game Advisory Committee (ULCAC) submitted a proposal at the request of the department to establish a Lynn Canal and Chilkat River chinook salmon fishery management plan. This plan, which will be considered during the January 2003 BOF meeting,

bases harvest options on the preseason run forecast.

The Burro Creek Hatchery (currently not in operation) and Jerry Myers Hatchery (operated by the Skagway High School) released chinook salmon smolts in the Skagway area for a number of years (Table 25). These releases were increased from 1992 to 1994 under an agreement with the Hidden Falls hatchery operated by NSRAA. Hidden Falls was allowed to discontinue use of the Tahini River brood stock under the condition that the remaining brood be released in Taiya Inlet near Skagway. As a result, the number of hatchery chinook salmon returning to the Skagway area increased for several years.

In 1998, Burro Creek hatchery sustained damage due to a flood and subsequent fire. As a result, all eggs were transferred to Macaulay Hatchery. The resulting smolt (91,600) were released in Pullen Creek in 2000. Since that time, eggs collected from Pullen Creek and Burro Creek have been incubated at the Macaulay and Jerry Meyers hatcheries for release in the Skagway area. Macaulay Hatchery has conducted these releases as a component of their program to develop the Tahini River stock as the primary brood for release in the Juneau and Skagway areas.

A growing charter boat industry targeting these hatchery fish has taken advantage of increased numbers of cruise ship passengers arriving in Skagway. The department hired a nonpermanent employee in 2002 to sample for CWTs 2 days a week in Skagway. During 2002, 14% (SE = 4%) of the small and 18% (SE = 4%) of the large chinook salmon sampled were missing adipose fins (Table 26). All of the successfully decoded tags were of Alaska hatchery origin, and 75% of the large and 73% of the small recoveries were from Skagway area releases.

### *Coho Salmon*

The Chilkat River supports one of the largest freshwater sport fisheries for coho salmon in the Southeast region, with annual harvests averaging about 1,000 coho salmon. This system also contributes a significant number of coho salmon to commercial troll, gillnet and seine fisheries in northern Southeast Alaska. Research conducted

**Table 25.—Number of hatchery chinook salmon smolts released in the Skagway area by brood year and facility, 1987–2002.**

Facility	Brood year	Date released	Number of smolt released
Jerry Myers	85	6/16/87	6,060
Jerry Myers	86	6/10/88	4,659
Jerry Myers	87	6/10/89	1,730
Jerry Myers	88	6/8/90	6,431
Jerry Myers	89	6/19/91	7,152
Jerry Myers	90	6/10/92	11,905
Hidden Falls	90	5/20/92	30,223
Jerry Myers	91	6/11/93	12,859
Hidden Falls	91	5/22/93	56,415
Burro Creek	91	6/3/93	8,572
Jerry Myers	92	6/11/94	1,650
Hidden Falls	92	5/20/94	38,789
Burro Creek	92	6/5/94	8,749
Jerry Myers	93	6/10/95	5,595
Burro Creek	93	6/10/95	1,903
Jerry Myers	94	5/24/96	1,507
Burro Creek	94	6/15/96	34,895
Burro Creek	95	6/21/97	12,815
Jerry Myers	96	6/10/98	8,631
Burro Creek	96	6/14/98	15,956
Jerry Myers	97	5/31/99	1,856
Macaulay	98	6/02/00	91,618
Macaulay	99	6/12/01	32,123
Macaulay	00	6/13/02	95,386

during the 1980s on coho salmon stocks in Lynn Canal suggests that these stocks are subjected to very high (over 85%) exploitation rates (Elliott and Kuntz 1988, Shaul et al. 1991). The department initiated a program to coded-wire-tag coho salmon smolt in the Chilkat River in 1999. During spring 2001, we tagged 35,997 coho smolts in the drainage. These fish returned as adults during fall, 2002. Chilkat River coho salmon were sampled in various fisheries throughout Southeast Alaska, and in Chilkat River fishwheels during 2002. Results of this study are that

**Table 26.—Number of small and large chinook salmon sampled for missing adipose fins at the Skagway Boat Harbor during 2002.**

Date	Examined for ad-clips		Ad-clipped	
	Small	Large	Small	Large
6/13	1	6	0	2
6/18	1	0	0	0
6/25	1	1	0	0
7/03	0	0	0	0
7/10	1	1	0	0
7/11	0	2	0	1
7/16	2	2	0	1
7/17	0	2	0	0
7/23	2	1	0	0
7/24	0	0	0	0
7/30	3	3	0	2
7/31	5	6	1	1
8/06	0	0	0	0
8/07	2	4	0	0
8/14	19	11	2	3
8/15	15	19	4	2
8/22	10	5	4	1
8/27	22	30	1	4
8/29	0	1	0	0
<b>Total</b>	84	94	12	17

2,970,458 (SE = 377,695) coho salmon smolt emigrated from the Chilkat River in 2001, and most of the estimated harvest in 2002 occurred in the commercial troll and Lynn Canal drift gillnet fisheries (Erickson *In prep.*,b). During the spring of 2002, we tagged 25,289 coho salmon smolt in the drainage. These fish will return as adults in 2003.

Coho salmon escapement into the Chilkat River was assessed using two methods in 2002. Peak survey counts of coho salmon to the Chilkat River in 2002 were well above the long-term average (Table 27). The long-term management program for Chilkat River coho salmon relies on postseason monitoring of escapements by an 'index system,' where survey counts are conducted on four streams: Clear Creek, Spring

Creek, Tahini River, and Kelsall River. The number of adult coho salmon is counted on one day during peak spawning. These index counts appear to reflect abundance trends in the Chilkat drainage given comparisons with three years of mark-recapture estimates (Table 27). We also conducted a mark-recapture study to estimate the number of adults entering the Chilkat River in 2002. The resulting estimate of 170,202 (SE = 26,596), confirms that abundance was very high in 2002 (Table 27).

### *Sockeye Salmon*

The Chilkoot Lake and River sport fishery is one of the largest freshwater sport fisheries in Southeast Alaska. Sockeye salmon returning to the Chilkoot River drainage support important sport, commercial, and subsistence fisheries. Although the sport fishery typically harvests fewer than 1,000 sockeye salmon per year, it has been very popular with residents and visitors to the area. CF Division monitors the escapement of sockeye salmon into the drainage using a weir. The weir count in 2002 was within the escapement goal range (52,500–91,500) for the second year in a row (Figure 15). As a result, management of this fishery was less restrictive than in recent years and the sport harvest of sockeye increased to historical levels (Figure 15).

### *Pink Salmon*

The escapements of pink salmon into the Chilkoot River have been very strong in recent years (Figure 16). The 2002 escapement was the highest on record. The large pink salmon escapements are primarily a result of good marine survival and restrictive management of the Lynn Canal commercial gillnet fishery to boost escapement of Chilkoot sockeye salmon.

### *Dolly Varden*

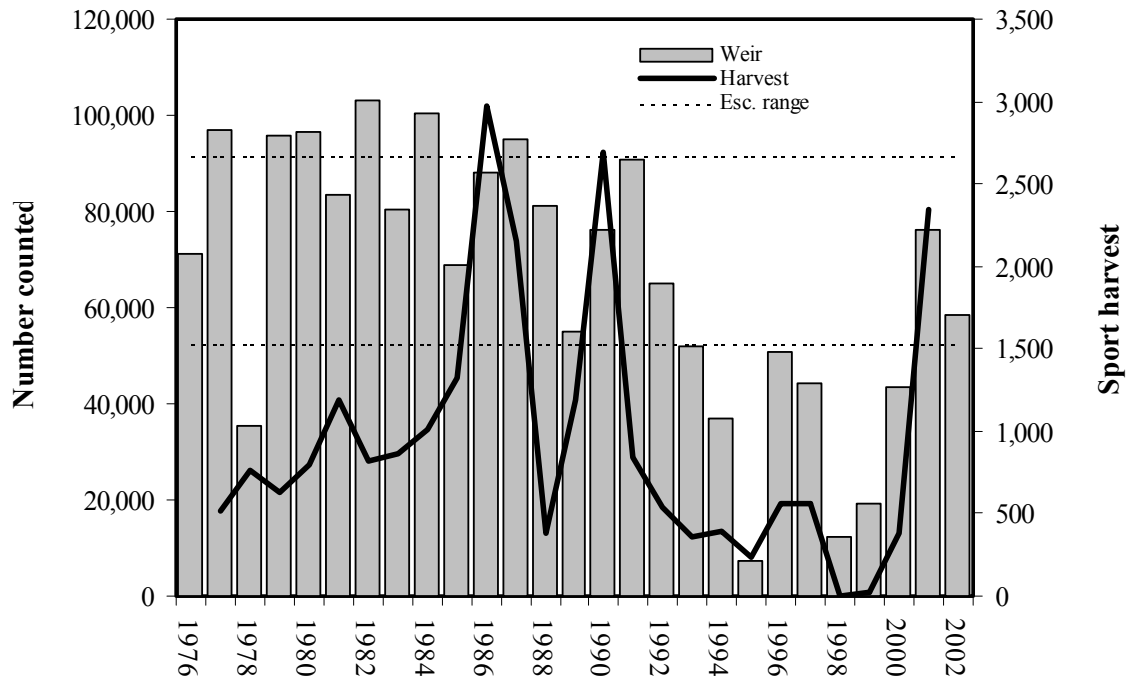
The Chilkoot Lake and River sport fishery supports the largest harvest of Dolly Varden in the region. This harvest peaked in 1985 at over 14,000 Dolly Varden and steadily declined until 1994 (Figure 17), suggesting the population might have been overexploited. As a result of this decline, the bag limit in the drainage was reduced from 10 to 2 per day in 1994. Since 1994, the harvest has remained stable at about

**Table 27.—Peak counts of coho salmon during surveys of four index streams to the Chilkat River, 1987–2002, and mark-recapture estimates of escapement, 1990, 1998, and 2002.**

Year	Peak survey counts					Mark-recap. estimate	SE	Ratio
	Spring Creek	Kellsall River	Tahini River	Clear Creek	Combined			
1987	84	184	696	23	987			
1988	83	152	539	35	809			
1989	48	182	981	134	1,345			
1990	79	328	2,448	150	3,005	80,700	9,984	0.0372
1991	176	392	1,707	135	2,410			
1992	174	266	1,077	700	2,217			
1993	95	115	947	460	1,617			
1994	398	440	4,419	381	5,638			
1995	253	178	1,029	177	1,637			
1996	180	157	381	290	1,008			
1997	204	129	643	250	1,226			
1998	264	262	638	275	1,439	37,132 <sup>a</sup>	7,432	0.0388
1999	324	202	930	195	1,651			
2000	302	551	1,302	420	2,575			
2001	441	221	1,252	1,285	3,199			
2002	1,274	423	2,536	1,310	5,543	170,202 <sup>b</sup>	26,596	0.0326
Average	274	261	1,345	389	2,269	96,011		0.0362

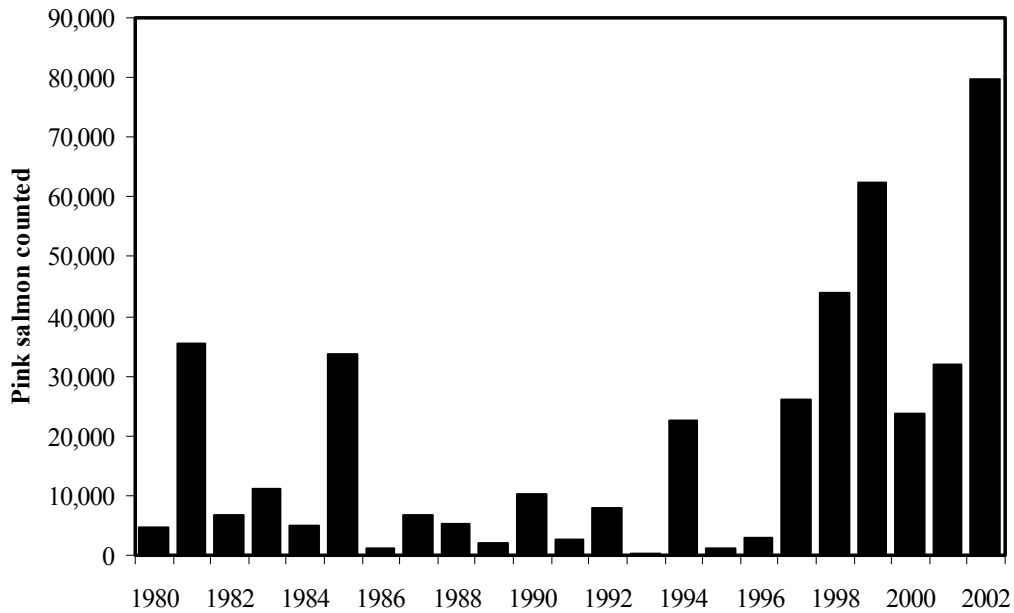
<sup>a</sup> 1998 mark-recapture estimate from Ericksen (1999).

<sup>b</sup> 2002 mark-recapture estimate from Ericksen (*In prep.*,b).

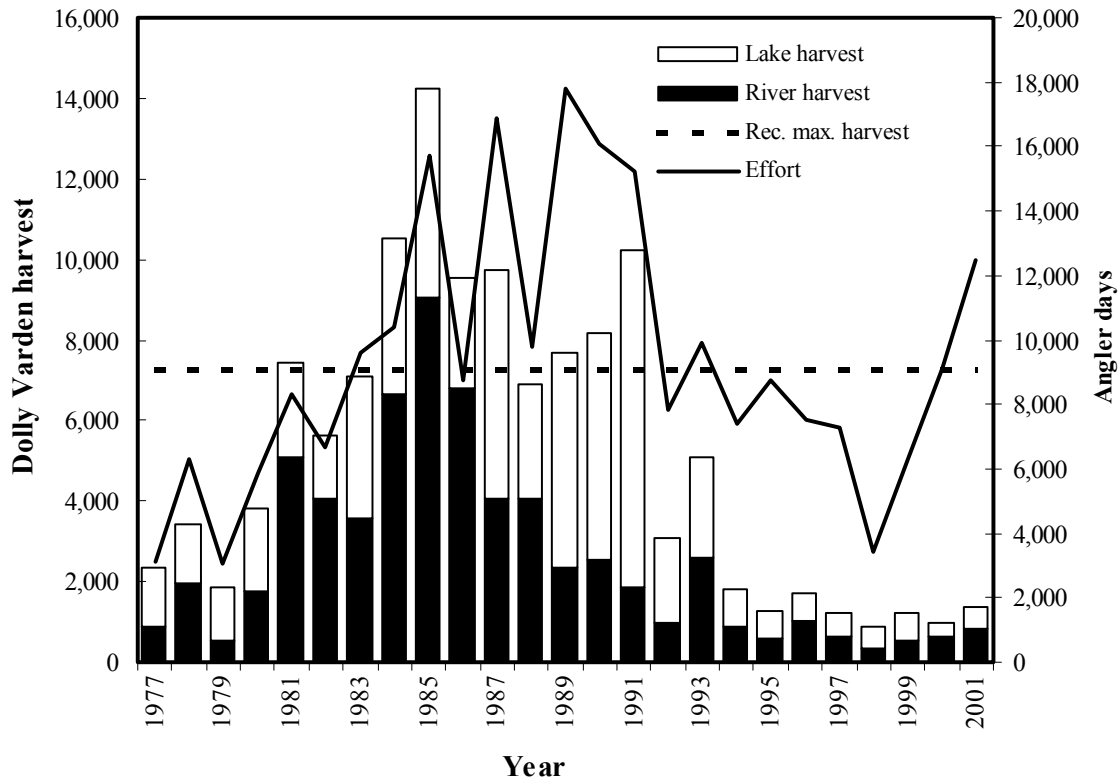


**Figure 15.—Number of sockeye salmon counted through the Chilkoot River weir (1976–2002) and total harvest in the Chilkoot River/Lake sport fishery (1977–2002).**





**Figure 16.—Number of pink salmon counted through the Chilkoot River weir (1980–2002).**



**Figure 17.—Total sport fishing effort and Dolly Varden harvest in the Chilkoot River/Lake sport fishery, 1977–2002.**

1,400 Dolly Varden per year. Because of the importance of the Chilkoot Dolly Varden sport fishery, research was conducted on the population during 1997 and 1998. During the winter of 1997–1998, we estimated that 109,152 (SE = 21,065) Dolly Varden  $\geq 220$  mm FL overwintered in Chilkoot Lake (Ericksen 2000). A per-recruit analysis of the population indicated that at similar population levels, the harvest should not exceed 7,300 fish annually (Ericksen 2000). Thus, current harvest levels are well within acceptable limits. The ULCAC submitted a BOF proposal to increase the bag and possession limit of Dolly Varden to 5. The department supports increased harvest opportunity of Dolly Varden in the drainage but recommends a lower limit of 4 Dolly Varden. This is primarily because of concerns about recent increases in sport fishing effort in the drainage (Figure 17) that will likely result in an increase in incidental harvest even without an increased limit. This proposal will be considered during the January 2003 meeting.

## **Management Actions**

### *Skagway Chinook Salmon Terminal Harvest Area Management*

One emergency order was issued during 2002 related to sport fishing for hatchery chinook salmon returning to the Skagway Area. The purpose of the emergency order was to liberalize bag and possession limits for chinook salmon and to close small areas to sport fishing to allow sufficient numbers of chinook salmon to escape for broodstock needs. Anglers fishing in Taiya Inlet north of the latitude of Taiya Point were allowed to keep small chinook salmon (1-11-02-EO). The bag and possession limit in Taiya Inlet was 1 chinook salmon 28 inches or more in length, and 1 chinook salmon <28 inches in length. This area was opened to allow harvest of surplus hatchery-produced chinook salmon released at Burro Creek and Pullen Creek.

Chinook salmon returning to Pullen Creek must migrate into the stream through a culvert accessible only during high tide. Hatchery fish must therefore mill in salt water off the mouth of the stream until a sufficiently high tide allows them to pass through the culvert. A similar

situation occurs at the mouth of Burro Creek where fish mill in salt water before migrating upstream. These fish are vulnerable to sport fishing in these areas. To ensure that enough chinook salmon entered Pullen Creek and Burro Creek for brood stock needs, the area of Taiya Inlet north of a line extending from a department marker on the Broadway Dock, to a department marker on the ore terminal dock; and the area enclosed in a 1,500 foot radius around the mouth of Burro Creek were closed to sport fishing by emergency order (1-11-02EO) from June 13 through August 31, 2002.

## **Access Projects**

Discussions continued with the City of Haines regarding the Portage Cove boat launch, and with Division of Parks (DOP) regarding improvements to the Chilkat State Park boat launch. The Portage Cove boat launch is currently on hold pending expansion of the Small Boat Harbor. DOP completed improvements to the Chilkat State Park boat launch during the summer of 2002.

## **Other Issues**

### *Land Use*

Work was completed on the Haines Highway realignment project. This project impacted fish habitat and required extensive mitigation work. This included extending a clearwater stream and creation of wetlands at 37 mile on the inside of the new highway.

Two hydropower projects near Skagway were active during 2002. Goat Lake Hydro went into operation in December of 1997 and planning and design continued on the Otter (Kasidaya) Creek Hydro project. Goat Lake was stocked with Arctic grayling in 1994 and 1995. These fish have survived and successfully spawned. It is unclear how a spring drawdown will affect future spawning success of the grayling. ADF&G requested that Alaska Power and Telephone conduct studies to determine whether grayling can access the spawning stream during the spring drawdown period. Kasidaya Creek is a high-gradient glacial stream that flows directly into

Taiya Inlet. Fish habitat is limited to the intertidal reaches of the stream.

### *DNR Management Plans*

The Alaska Department of Natural Resources (DNR) completed three management plans involving the Haines/Skagway area in 2003. These include the Northern Southeast Area Plan, the Haines State Forest Management Plan, and the Chilkat Bald Eagle Preserve Management Plan. Haines area staff was involved in attending public meetings and providing input into draft plans.

### *Skagway Chinook Enhancement*

Skagway residents are actively pursuing ways to increase the number of chinook salmon released in their area. With the conclusion of releases of Hidden Falls fish and the imminent sale and/or closure of the Burro Creek Hatchery, another rearing facility was needed to continue smolt releases in the area.

Douglas Island Pink and Chum, Inc. (DIPAC) is currently working with the city of Skagway to cooperatively develop the Tahini River broodstock for potential use in Skagway and at DIPAC's Macaulay facility near Juneau. DIPAC is also working with the city of Skagway on plans to construct and operate a new facility located on the mouth of Pullen Creek. The facility would replace the existing Jerry Myers Hatchery and be available to Skagway High School students to continue their hatchery curriculum.

However, the City of Skagway has not made significant progress toward obtaining funding or the necessary plans and permits for such a facility. DIPAC released 95,386 chinook smolt in Pullen Creek in 2002 (Table 25) and was holding about 100,000 chinook fry (2001 brood year) and 150,000 chinook eggs (2002 brood year) in 2002 for release in the Skagway area.

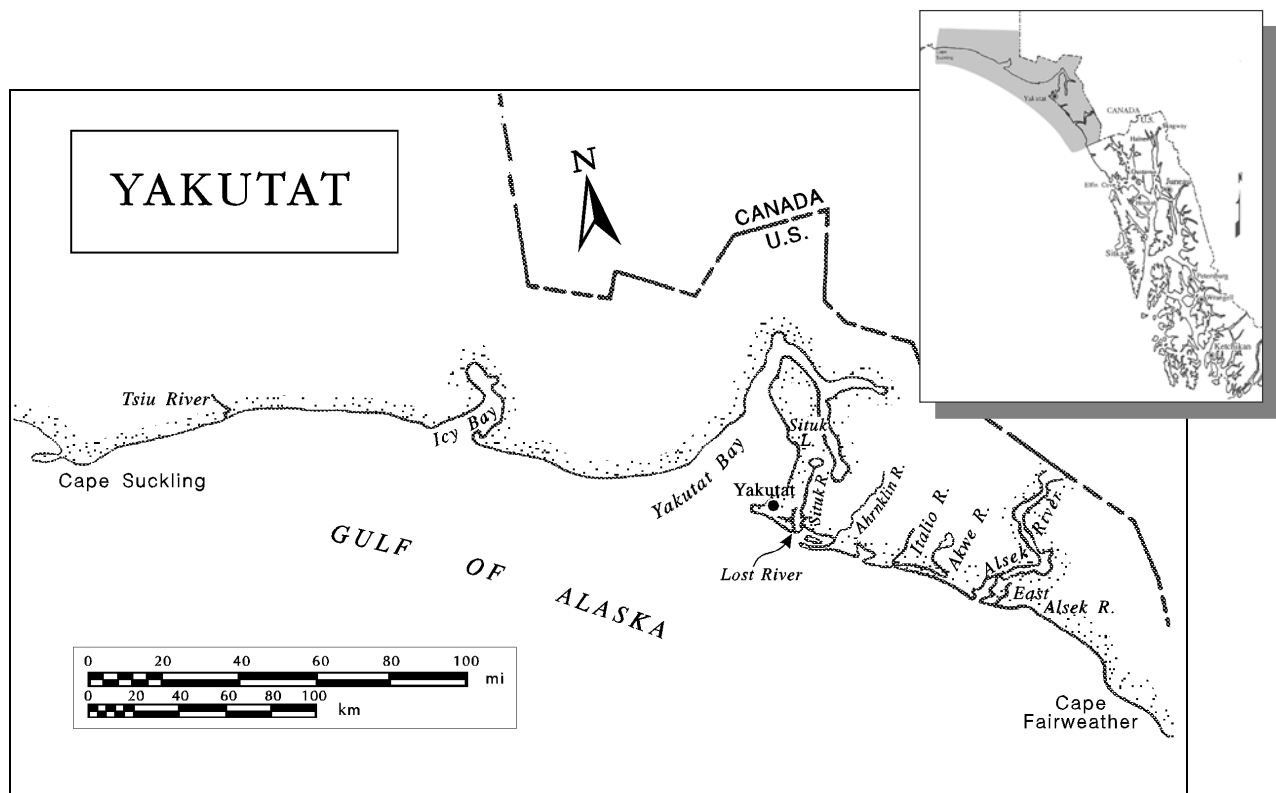
## **YAKUTAT AREA**

The Yakutat management area includes all waters of Alaska draining into the Gulf of Alaska from Cape Suckling to Cape Fairweather (Figure 18). The major fisheries of the Yakutat area are in salt water for Pacific halibut, lingcod, coho salmon, and chinook salmon, and in fresh water for steelhead, chinook salmon, coho salmon, and sockeye salmon. Permanent Sport Fish management staff consists of one Fishery Biologist III, Robert Johnson, stationed in Yakutat.

### **Local Management and Research Programs**

#### *Yakutat Marine Catch Sampling and Situk River Creel*

The Yakutat area sport lingcod fishery takes place primarily within the Icy Bay Groundfish Management area. The guideline harvest level for the sport fishery within this area is set at 33,000 pounds. For several years, the sport lingcod fishery exceeded this harvest level and the minimum size restriction imposed in 2001 was not effective in reducing the total weight of lingcod landed. As a result, effective Thursday, May 16, 2002, new lingcod length and bag restrictions were imposed (1-06-02EO) to reduce the Yakutat area lingcod harvest. The regulations reduced the lingcod limit to 1 fish per day, 2 in possession for all anglers. Additionally, a slot limit with a minimum size of 32 inches and a maximum size of 42 inches was established for guided and nonresident anglers in Yakutat and northern Southeast Alaska. To test the effect of these new regulations, a technician contacted anglers returning to the Yakutat harbor from August 13 through August 24 and measured lengths and determined sex from all lingcod encountered. A total of 72 lingcod were sampled. A comparison of lingcod harvested during the same time period during 2000 and 2001 indicates that the new lingcod regulations reduced the numbers of lingcod harvested. Additionally, the average weight of fish landed decreased and the male component of the harvest increased to 25% from the 1% observed during 2001.



**Figure 18.—Yakutat management area.**

From June 5 through July 26, the creel technician interviewed anglers at the Situk River chinook salmon fishery. This sampling estimated a preliminary sport harvest of only 55 large ( $\geq 28$  inches in length) chinook salmon. The low harvest can be attributed to the smaller than average run size, and the management actions described below which were taken to assure attainment of the escapement goal. Scale samples were collected from chinook salmon harvested in the Situk fishery.

#### *Situk River Steelhead Escapement Monitoring*

The Situk River produces the largest run of steelhead in Southeast Alaska and the largest spring steelhead run in all of Alaska. Recent runs of steelhead to the river have varied between about 5,800 and 9,200 fish. Low steelhead numbers in 1991 and 1992 in the Situk River prompted conservation concerns that resulted in regional regulations to reduce harvest to a minimum (i.e., artificial unbaited lures only, with only one fish  $\geq 36$  inches in total length per day, and 2 per season).

The Situk steelhead population attracts a substantial number of anglers. Each year, more steelhead are caught and released in the Situk River than are counted through the weir. This means most fish are caught more than once. Annual harvest of these fish is very low (Table 28).

Steelhead abundance is currently monitored by counting emigrant adults (kelts) at a weir and by counting adults in float surveys (Johnson and Jones 2001). Between May 2 and August 8, 2002 we counted 6,112 steelhead emigrating downstream through a weir located 1.2 miles upstream of the Lower Landing on the Situk River. This count continues a decline from the 9,204 steelhead counted in 1999, which was the highest count since the early 1950s.

The peak of emigration during 2002 occurred on June 5, when 548 steelhead were counted downstream through the weir. A total of 674 steelhead were sampled for length, scales, sex, and condition.

**Table 28.—Steelhead catch and harvest, Situk River, 1997–2001.**

Year	Catch	Harvest
1997	8,649	101
1998	7,912	11
1999	13,654	80
2000	15,235	0
2001	11,673	52

Two float surveys from Nine Mile Bridge downstream to the lower landing were conducted during the spring of 2002. The highest float survey index count occurred on May 14 when 1,735 steelhead were counted (19% of the total weir count). Overcast conditions and occasional precipitation reduced visibility, especially in the lower river.

#### *Alsek River Chinook Salmon Project*

A mark-recapture project to estimate chinook abundance continued on the Alsek River in 2002. Chinook salmon are captured in gillnets in the lower river and recaptured on the spawning grounds and at the Klukshu River weir. The project was conducted in conjunction with a sockeye salmon mark-recapture experiment conducted by Commercial Fisheries Division and Canada. The chinook salmon abundance estimate is not yet available. A radio-tracking study was also conducted to determine chinook salmon spawning distribution. Preliminary results indicate a greater than expected proportion of spawning occurring in the upper Tatshenshini River (Pahlke and Etherton, *In prep.*).

### **Management Actions**

#### *Situk River Chinook Salmon Management*

The Situk River is managed for a chinook salmon escapement of 450 to 750 large (age 3-ocean or older) fish with a midpoint of 600 large chinook salmon as the goal. Returns are highest when escapements are between 600 and 1,100 large spawners, and returns are lower when escape-

ments are above or below that range with the magnitude of reduction increasing the farther outside the escapement range you get.

The chinook salmon fishery was monitored with a sampling program to estimate chinook salmon harvest and age-at-length in the sport fishery. Managers projected that the 2002 Situk River chinook salmon escapement would likely fall below 600 large fish. At this level, the Situk-Ahrnklin Inlet and Lost River Chinook Salmon Commercial Fishery Management Plan directs the department to restrict the sport fishery to catch and release of large fish.

The run was monitored closely and by July 2 the weir count was 497 large king salmon. Managers projected that the 2002 Situk River king salmon escapement goal would fall between 600 and 1,000 large fish. Therefore, an emergency order (1-21-02EO) was issued, increasing the bag limit in the Situk River for king salmon 20 inches or greater in length to one fish per day and in possession downstream from the markers located approximately 100 yards below the Situk River Weir. These regulations became effective at 12:01 a.m. on Wednesday, July 3, 2002.

By July 7, the weir count was 731 large king salmon, and managers projected that the 2002 Situk River king salmon escapement would exceed 750 large fish. Accordingly, an emergency order (1-22-02EO) was issued to increase the area where king salmon retention was allowed from the Middle Situk Airstrip to the stream mouth. These regulations became effective at 12:01 a.m. on Wednesday, July 10, 2002 and remained in effect for the remainder of the season.

#### *Situk River Sockeye Salmon Management*

The escapement range for sockeye salmon in the Situk River is 30,000–70,000 fish. The point escapement goal is 50,000 fish. Sockeye returns during 2002 started off strong, and then tracked at or above the upper escapement goal range during the entire season. As a result, no emergency management actions were required. The final Situk River sockeye escapement for 2002 was 68,774 fish.

## Surveys

In addition to the steelhead escapement surveys conducted on the Situk River discussed above, the Situk River was surveyed on September 25 for coho salmon. A total of 40,000 coho salmon were counted, under fair, but high water conditions. This was a record coho survey for the Situk River.

The East Alsek River was surveyed by air on July 31, 2002, when 14,200 sockeye were observed.

## Access Projects

Improvements to the Yakutat boat harbor launch ramps were completed this summer; however, work to move existing electrical lines and completion of the parking area still needs attention. Recently completed trails along the Situk River upstream from the Lower Landing and brushing projects near the Middle Situk cabins were inspected.

## Other Issues

The development of a Local Area Management Plan for Pacific halibut by local user groups seems to have stalled and there was no action taken on this issue by the Board of Fish. Meetings to revise the Situk River Management Plan continued with the U. S. Forest Service, Yakutat Tlingit Tribe, the City and Borough of Yakutat, and State of Alaska (The "Partners") participating.

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